E-4203 / E-4204 / E-4304

Operator's Manual

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Part Number: 88-2256-01

Revision: G

Agency Compliance and Approvals:

UL1950 Information Technology Equipment
C22.2 No. 950-M93

EN60950

For 230 Volt Operation (Europe): Use a cord set, marked "HAR," consisting of a min H05VV-F cord which has a minimum 0.75 square mm diameter conductors, provided with an IEC 320 receptacle and a male plug for the country of installation rated 6A, 250V

Für 230 Volt (Europa): Benützen Sie ein Kabel, das mit "HAR" markiert ist, bestehend mindestens aus einem H05VV-F Kabel, das mindestens 0,75 Quadratmillimeter Drahtdurchmesser hat; sowie eine IEC320 Steckdose und einen für das Land geeigneten Stecker, 6A, 250 Volt.

As an Energy Star Partner, the manufacturer has determined that this product meets the Energy Star guidelines for energy efficiency.

The manufacturer declares under sole responsibility that this product conforms to the following standards or other normative documents:

EMC: EN 55022 (1993) Class A
EN 50024 (1998)

Safety: This product complies with the requirements of EN 60950 /A11:1997

Gost-R

FCC: This device complies with FCC CFR 47 Part 15 Class A.

☑ **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important Safety Instructions

This printer has been carefully designed to provide many years of safe, reliable performance. As with all electrical equipment, there are a few basic precautions you should take to avoid hurting yourself or damaging the printer:

- Carefully read the installation and operating instructions provided with your printer.
- Read and follow all warning instruction labels on the printer.
- Place the printer on a flat, firm, solid surface.
- To protect your printer from overheating, make sure all openings on the printer are not blocked.
- Do not place the printer on or near a heat source.
- Do not use your printer near water, or spill liquid into it.
- Be certain that your power source matches the rating listed on your printer. If you are unsure, check with your dealer or with your local power company.
- Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.
- Do not insert anything into the ventilation slots or openings on the printer.
- Only qualified, trained service technicians should attempt to repair your printer.

Contents

Printer Overview

1.0 Introduction 1
1.1 About this Printer 2
1.1.1 Standard Features 2
1.1.2 Optional Features 3

Getting Started

2.0 Before using the Printer 5

Setting Up the Printer

3.0 Introduction 7
3.1 Connecting the Printer 7
3.1.1 Power Connection 7
3.1.2 Interface Connection 8
3.1.3 Interface Cables 8
3.2 Adjusting the Media Sensor 9
3.3 Loading Media 12
3.3.1 Loading Media for Peel Configuration 14
3.4 Loading Ribbon 15
3.5 Flash Memory Expansion 17

Using the Front Panel

4.0 Introduction 19
4.1 Lights 19
4.2 Buttons 20
4.3 Normal Mode - Button Functions 20
4.4 Printer Setup Mode - Button Functions 21
4.4.1 Printer Setup Menu List 22
4.4.2 Menu Items and Values 23
4.4.3 Step by Step Modification 26
4.5 Label Alignment 28
4.5.1 Label Alignment = YES 28
4.5.2 Label Alignment = AUTO 29
4.5.3 Label Alignment = NO 29

4.5.4 Label Alignment Troubleshooting 30
4.6 Calibration Mode – Button Functions 34
4.6.1 Auto Media Sensor Calibration 35
4.6.2 Manual Media Sensor Calibration 36
4.7 Internal Labels 37
4.7.1 Database Configuration/Dot Check Labels .. 37
4.7.2 Test Label 39
4.7.3 Hex Dump Label 39

Maintenance and Adjustments

5.0 Introduction 41
5.1 Cleaning the Printhead 42
5.2 Media Width Adjustment 43
5.3 Ribbon Width Adjustment 44
5.4 Fine Printhead Adjustment 45
5.5 Printhead Replacement 46
5.6 Darkness Adjustment 47
5.7 Resetting to the Factory Defaults 47
5.8 Downloading Firmware and Fonts 47

Troubleshooting

6.0 Introduction 49
6.1 Troubleshooting Tips 49

Specifications

Mechanical 53
Printing 53
Media/Ribbon 54
Communications 54
Fonts 54
Embedded Bar Codes 54
Approved Media 55

Appendix A

ASCII Control Code Chart..... 57

Appendix B

Embedded Fonts and Barcodes 59

Appendix C

Warranty Information 69

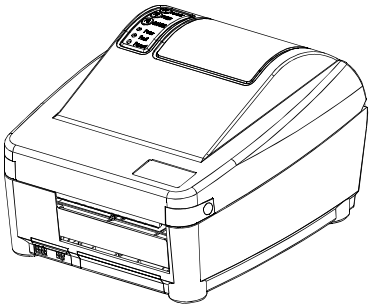
Glossary 73

Index 79

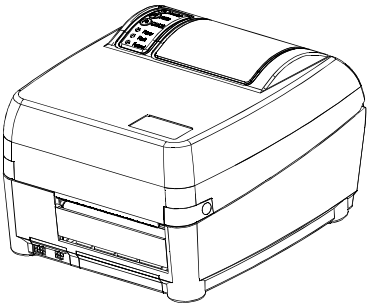
Printer Overview

1.0 Introduction

The E-4203, E-4204, and E-4304 (hereafter referred to as 'the printer') are user-friendly printing devices that blend quality and durability into an affordable package. The printer, available in direct and optional thermal transfer configurations, uses a unique front panel design to simplify operation, while its RS232 serial and parallel interfaces allow easy connection to your host system.



Direct Thermal Model



Thermal Transfer Model

This manual provides all the information necessary to operate the printer.

To print labels or tags simply refer to the instructions included with the software you have chosen to create the labels. A Windows™ printer driver can be found on our website (www.datamaxcorp.com) or on the Datamax Accessories CD-ROM. If you wish to write a custom program, a copy of the *E-Class Programmer's Manual* (part number 88-2265-01) can also be found on the Accessories CD-ROM.

1.1 About this Printer

This printer offers the following standard and optional features:

1.1.1 Standard Features

Printing

- Direct Thermal Printing
- On Demand and Batch Printing
- 203 or 300 DPI Printhead (*model dependant*)
- AGFA Scalable Font Engine

Memory

- 1 MB FLASH Memory
- 2 MB DRAM Memory

Interfaces

- RS-232 serial interface
- Centronics® parallel interface

Operational

- Simple Media Loading
- Media Tearbar
- Fan-fold media compatible from rear of printer
- 1inch (25mm) internal media supply core

1.1.2 Optional Features

Adjustable Media Sensor

The Adjustable Media Sensor allows the printer to detect the position of the gap, notch, or reflective mark at many locations across the media.

External Media Supply Stand

The External Media Supply Stand allows the printer to use large media supply rolls, up to 8-inches in diameter and wound on one to three inch cores. (Not available for the E-4304.)

FLASH Memory Expansion

The FLASH Expansion cartridges are used for permanent storage of custom fonts, formats and graphics. The FLASH memory cartridges cannot be used in conjunction with the ILPC option.

Heavy Duty Power Supply

The Heavy Duty Power Supply is available for use in high demand applications. This power supply will also increase the E-4203's print speed capability to 4 IPS.

ILPC

The International Language Print Capability consisting of one of the following:

- CG-Times (western European) Scalable font
- Kanji Gothic B Scalable font
- Simplified Chinese GB Scalable font

Media Cutter

The Media Cutter automatically cuts your tag or label media after printing. This device mounts easily onto the front of the printer.

Present Sensor

The Present Sensor allows the printer to be configured for “one up” printing. With the sensor installed, the printer will not print the next label until the previously printed label has been removed from the printer.

Thermal Transfer

The Thermal Transfer option allows the printer to use ribbon. The ink/wax from the ribbon transfers to the media to create an image with exceptional clarity and scanability.

Getting Started

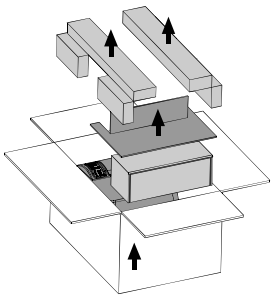
2.0 Before Using the Printer

Removing the Packaging

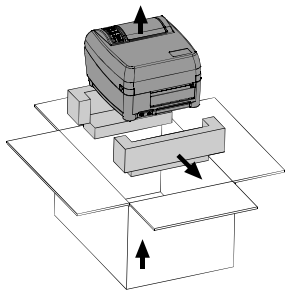
Inspect the shipping container(s) for damage; if damage is evident notify the shipping company to report the nature and extent of the damage.

The printer is carefully packaged to avoid any damage during transit. In order to operate the printer you will need to remove the packaging materials (i.e., tape and foam) that were placed in the printer for shipment. Complete the following steps prior to connecting power or attempting to load media.

- Ensure that the arrow on the box is pointing up, and then open the box.



- Remove the packing foam, cardboard divider, and power supply box.
- Lift the printer from the box and remove the packing foam.



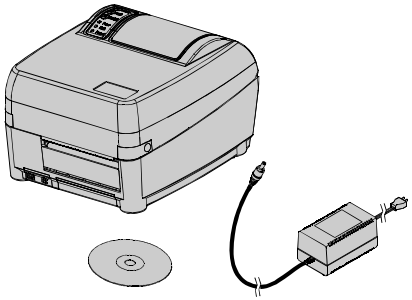
- Remove the printer from the plastic bag.

☑ **Note:** It is a good idea to save all packaging materials in the event that shipping the printer is ever required.

Inspecting the Printer

After removing the printer from the packaging material, check the contents. The following items should be included:

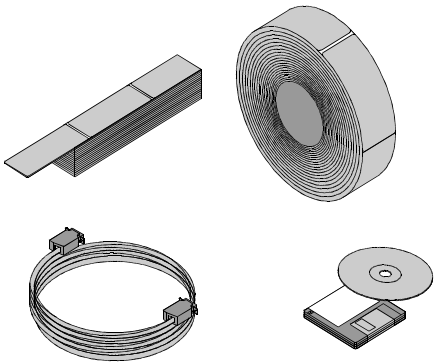
- Printer
- Power supply
- Accessories CD-ROM
- Any special or additionally purchased items.



Additional Requirements

The following items are necessary for generating labels from your printer. Contact your customer support representative for advice on which media and software may best be suited for your application.

- Serial or parallel cable
- Applicable media
- Applicable software



Setting Up the Printer

3.0 Introduction

This chapter explains how to connect your printer, load media (and ribbon, if equipped for thermal transfer), and print a configuration label.

3.1 Connecting the Printer

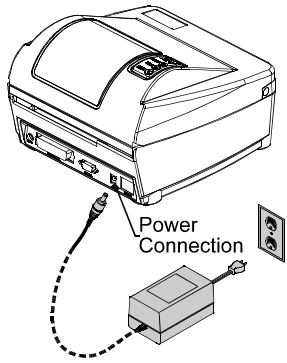
3.1.1 Power Connection

The printer is powered by an external power supply that connects as shown below. Several different power supplies are available depending upon the printer model.

Model	Auto-Ranging	Power Supply Part Number*
E-4203	No	110V: 50-2024-01 220V: 50-2034-01
E-4203 with the 4 IPS option	Yes	50-2050-01
E-4204	Yes	50-2050-01
E-4304	Yes	50-2050-01

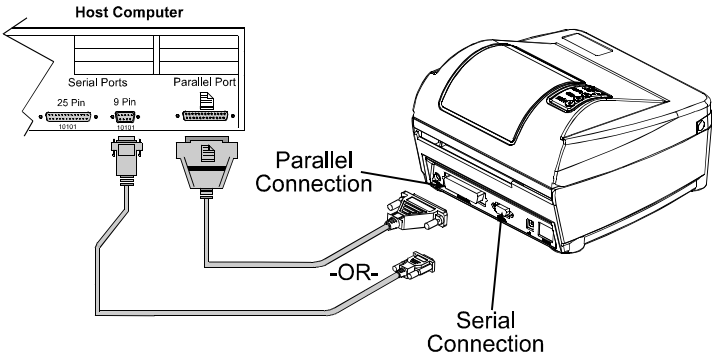
* An optional Heavy Duty Power Supply (50-2049-01), designed for use in high-demand applications, is available for use with all models; see Specifications for details.

Ensure that the power supply shipped with your printer is compatible with your electrical service.



3.1.2 Interface Connection

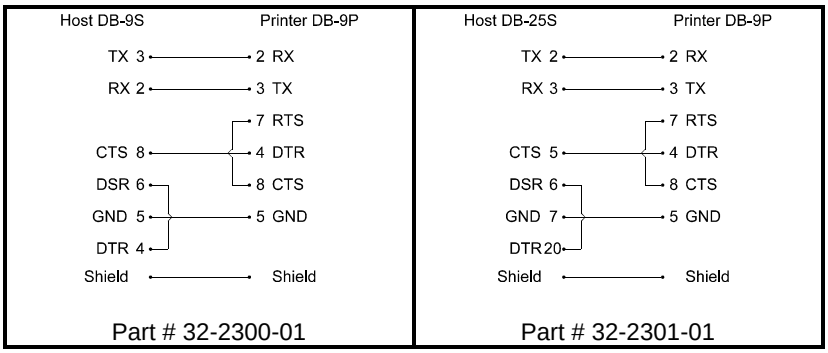
The printer can be connected to the host via a **serial** or **parallel** cable.



3.1.3 Interface Cables

Choose a connection method that will best serve your purpose:

To connect the printer to the host's serial (RS-232C) interface use an acceptable cable configuration, as shown below (contact your reseller for ordering information).



To connect the printer to the host's parallel interface use a Centronics® parallel cable.

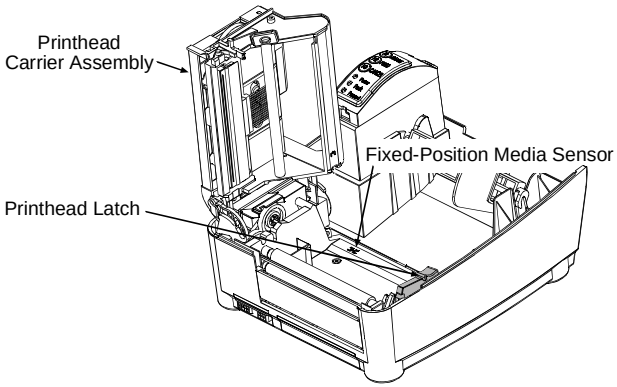
Note that the printer has a unique feature: When connected via both the interfaces, it will automatically connect to the first port (serial or parallel) that transmits valid data. After this connection has been made, the printer's power must be cycled 'Off' and 'On' to change the interface connection.

3.2 Adjusting the Media Sensor

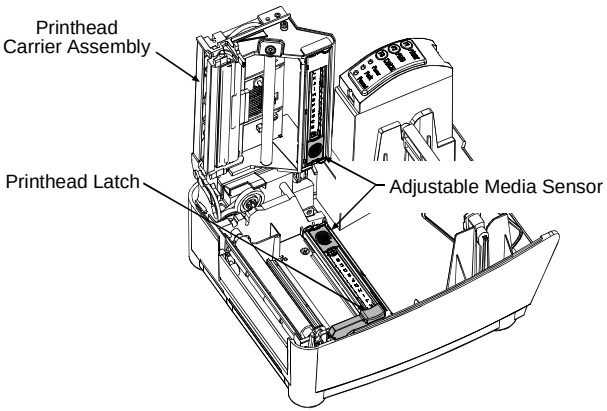
The printer is available with a Fixed-Position Media Sensor or an Adjustable Media Sensor. To identify the type of sensor in your printer:

1. Open the cover.
2. Push down the Printhead Latch and raise the Printhead Carrier Assembly.

The **Fixed-Position Media Sensor**, shown below, cannot be moved. If your printer has this type of sensor, proceed to 'Loading Media' (Section 3.3).



The **Adjustable Media Sensor** (AMS), shown below, may need to be positioned.



The position of the AMS is important for the proper detection of media and the label top of form (TOF). The table below indicates suggested sensor positions for various media types.

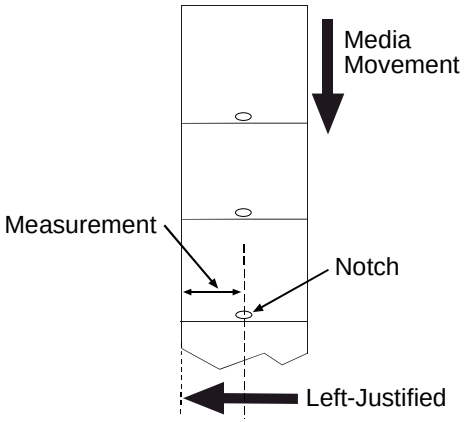
Adjustable Media Sensor Position		
Media Type	**Suggested Sensor Placement**	**TOF Sensing Used**
Continuous*	Near the center of the media	Continuous
Die-cut	Near the center of the label	Gap
Notched	Near the center of the notch	Gap
Reflective	Near the center of the black mark	Reflective

*Label TOF for continuous media is set via the Front Panel (CONT FORM LENGTH) or software; see Section 4.4.2.

To properly position the AMS, you will need to know where the TOF mark is located on your media. (For more information on media, see Specifications).

Depending of your media type, take a measurement from the left-justified media edge across to the center of the TOF mark as suggested in the table above. The following example illustrates the measurement of notched media.

☑ **Note:** Reflective marks are placed on the underside of the media.

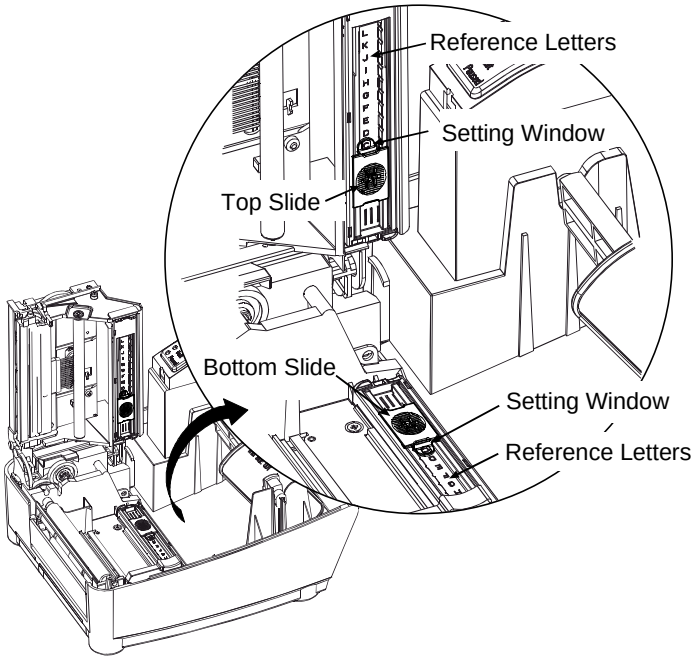


To simplify the adjustment, the AMS uses Reference Letter designators that correspond to the following TOF mark distances:

Reference Letter	Distance of the TOF Mark Distance from the Media Edge (inches)	(millimeters)
A	.180	4.6
B	.500	12.7
C	.750	19.1
D	1.00	25.4
E	1.25	31.8
F	1.50	38.1
G	1.75	44.5
H	2.00	50.8
I	2.25	57.2
J	2.50	63.5
K	2.75	69.9
L	3.00	76.2

Position the Adjustable Media Sensor as follows:

1. Based on the measurement made earlier, choose the Reference Letter that best corresponds to the location of your TOF mark.



2. Use a finger to move the Bottom Slide until your selected Reference Letter appears in the Setting Window of the slide.

3. Use a finger to move the Top Slide until your selected Reference Letter appears in the Setting Window of the slide.

> ☑ **Note:** The Top and Bottom Slides must be positioned over the same Reference Letter for proper media sensor function.

4. Proceed to 'Loading Media' (Section 3.3).

3.3 Loading Media

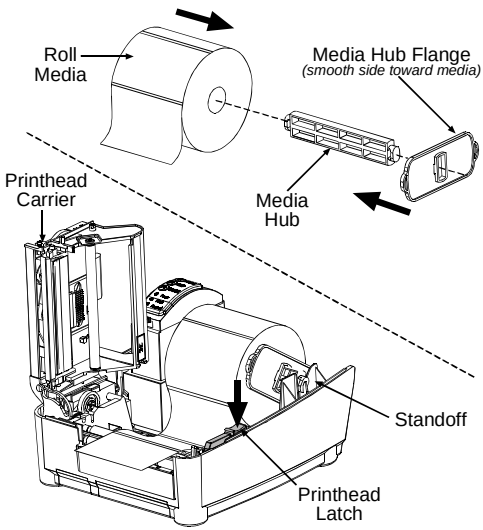
Load media into the printer as follows:

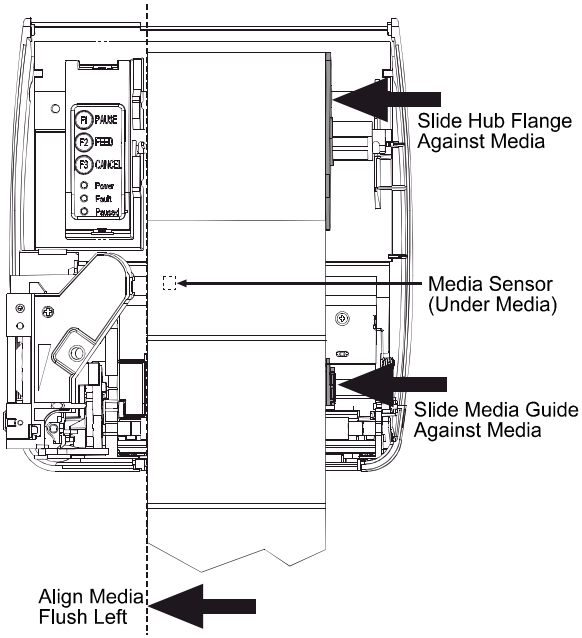
1. With the Cover open and the Printhead Carrier Assembly raised, remove the Media Hub and insert it through the Roll Media (with the labels spilling forward).

2. Place the Media Hub Flange (with its smooth side toward the media) onto the Media Hub.

3. Place the Media Hub, flange, and media onto the Standoffs in the printer.

4. Route the media through the printer, as shown below.





5. Slide the Media Guide and Media Hub Flange to the edge of the media.

6. Close the Printhead Carrier Assembly and press down until it locks into place.

7. Close the cover and press the Feed button several times to position the media and ensure proper tracking.

   (If the printer does not correctly sense the top of each label, as denoted by the FAULT Light, it may be necessary to perform the Calibration Procedure, Section 4.6.)

☑ **Note:**	The printer is factory set to use 4-inch media (and ribbon, if thermal transfer equipped). When using a different width of media/ribbon, please refer to Chapter 5.

3.3.1 Loading Media for Peel Configuration

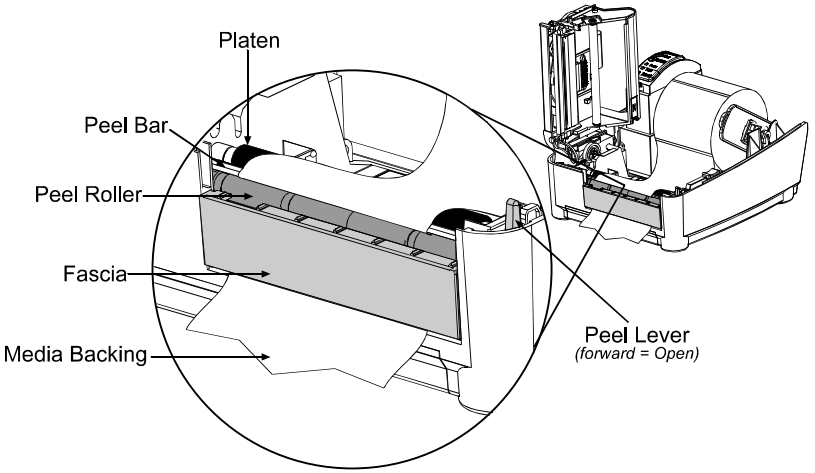
1. Open the cover.

2. Push the Printhead Latch down and raise the Printhead Carrier Assembly.

3. Place a roll of media (labels facing up) on the Media Hub and insert them into the printer. Slide the Media Hub Flange with its smooth side towards media onto the Media Hub.

4. Pull the Peel Lever forward to the 'Open' position.

5. Remove 6″ (152 mm) of labels from the backing. Route the Media Backing over the Platen and Peel Bar and behind the Peel Roller and Fascia as shown below.



6. Push the Peel Lever back to the 'Closed' position.

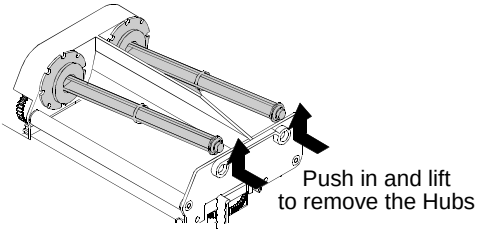
7. Close the Printhead Carrier Assembly and press down until it locks into place.

8. Close the cover and press the Feed button several times to advance the media and ensure proper tracking. The labels will separate automatically as it is fed through the printer. (If the printer does not correctly sense the top of each label, as denoted by the FAULT Light, it may be necessary to perform the Calibration Procedure, Section 4.6.)

3.4 Loading Ribbon

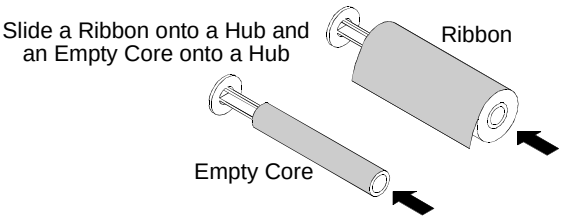
Ribbon is required with thermal transfer media. If your printer is equipped with the thermal transfer option and if you will be using thermal transfer media, load ribbon as follows:

1. Open the cover.



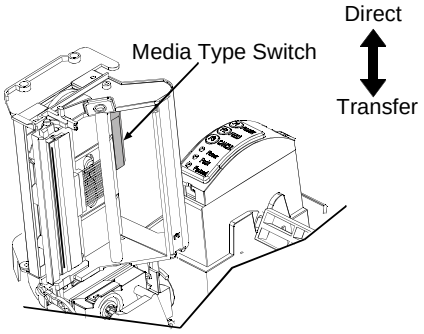
2. Remove both Ribbon Hubs.

3. Slide a roll of Ribbon onto one of the Ribbon Hubs and an Empty Core onto the other hub.

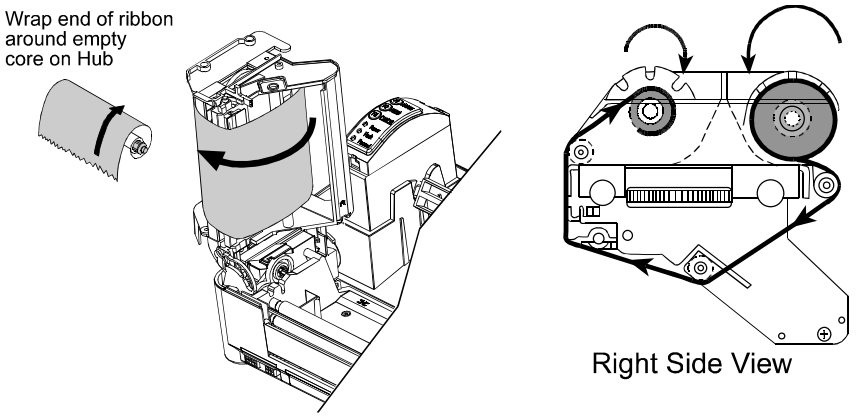


4. Push the Printhead Latch down and raise the Printhead Carrier Assembly.

5. Slide the Media Type Switch into the 'Transfer' position.



6. Place the Ribbon Hubs back into the printer and route the ribbon through the Printhead Carrier Assembly, as shown below.



☑ **Note:** Ensure the inked side of the ribbon faces the media and NOT the printhead.

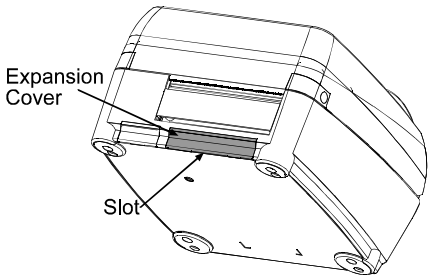
7. The 'Media Type' setting within the printer's setup must be set to 'Thermal Transfer' to print using a ribbon. See Section 4.4.

3.5 Flash Memory Expansion

The printer can be equipped with the optional Flash Memory Expansion. This additional memory can be used to store label formats and fonts (for font downloading instructions, see Section 5.8).

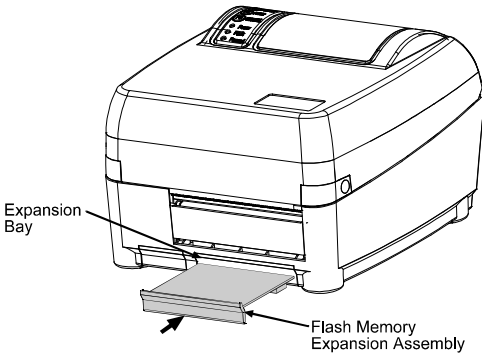
To install the Flash Memory Expansion:

1. Turn the power off and unplug the printer. Remove any installed media from the printer.



2. Using a coin, flathead screwdriver, or similar object, insert it into the Slot on the underside of the printer and gently pry the Expansion Cover from the printer.

3. With its connector facing down, as shown, gently insert the Flash Memory Expansion Assembly into the Expansion Bay until the assembly is firmly seated.



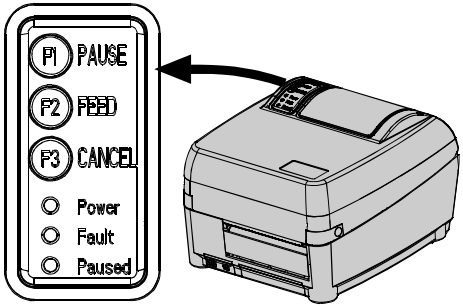
4. Plug in and turn on the printer.

☑ **Note:**	When using a blank expansion module for the first time, the printer will automatically format it upon power-up; this initial format can take up to one minute to perform.

4 Using the Front Panel

4.0 Introduction

The Front Panel consists of three indicator lights and three dual-function buttons. The functions of these indicators and controls are listed below.



4.1 Lights

(Normal power-up)

Normal Mode

- ○ Power — *Indicates the printer is on*
- ○ Fault — *Indicates a top of form or mechanical error has occurred*
- ○ Paused — ***Solid On:*** *Indicates the printer is in the 'Paused' state*

  Blinking: *Indicates the printer is receiving data from the host*

- Both the POWER and PAUSED Lights will be on during power-up initialization and a warm reset.

4.2 Buttons

The three buttons (PAUSE, FEED and CANCEL) perform different functions based on the printer's operational mode. The printer operates in one of the following modes:

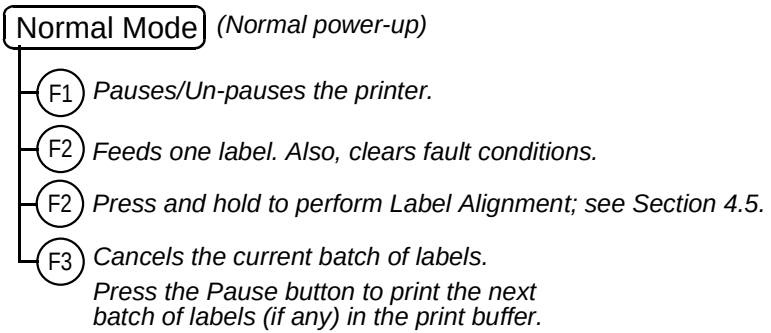
Normal: Normal printer functions. See Section 4.3.

Printer Setup: Allows changes to the printer's operational settings. See Section 4.4.

Calibration: Allows the 'calibration' of the media being used for the correct sensing of the top of form. See Section 4.6.

4.3 Normal Mode - Button Functions

In 'Normal' mode, the printer's buttons control normal operations such as pause, feed, and cancel, as well as the test and reset functions by using button combinations as detailed below.


Normal Mode
(Normal power-up)
F1
Pauses/Un-pauses the printer.
F2
Feeds one label. Also, clears fault conditions.
F2
Press and hold to perform Label Alignment; see Section 4.5.
F3
Cancels the current batch of labels.
Press the Pause button to print the next batch of labels (if any) in the print buffer.

Button Combinations *(push buttons simultaneously)*

F1	+	F2	Prints the Test Label, see Section 4.7.2.
F1	+	F3	Performs a warm reset and returns to the Normal Mode of operation.
F2	+	F3	Produces Database Configuration and Dot Check Labels.

4.4 Printer Setup Mode - Button Functions

In 'Printer Setup' mode, the buttons control the setting of the printer's operational items such as media settings, communications, and options as detailed below.

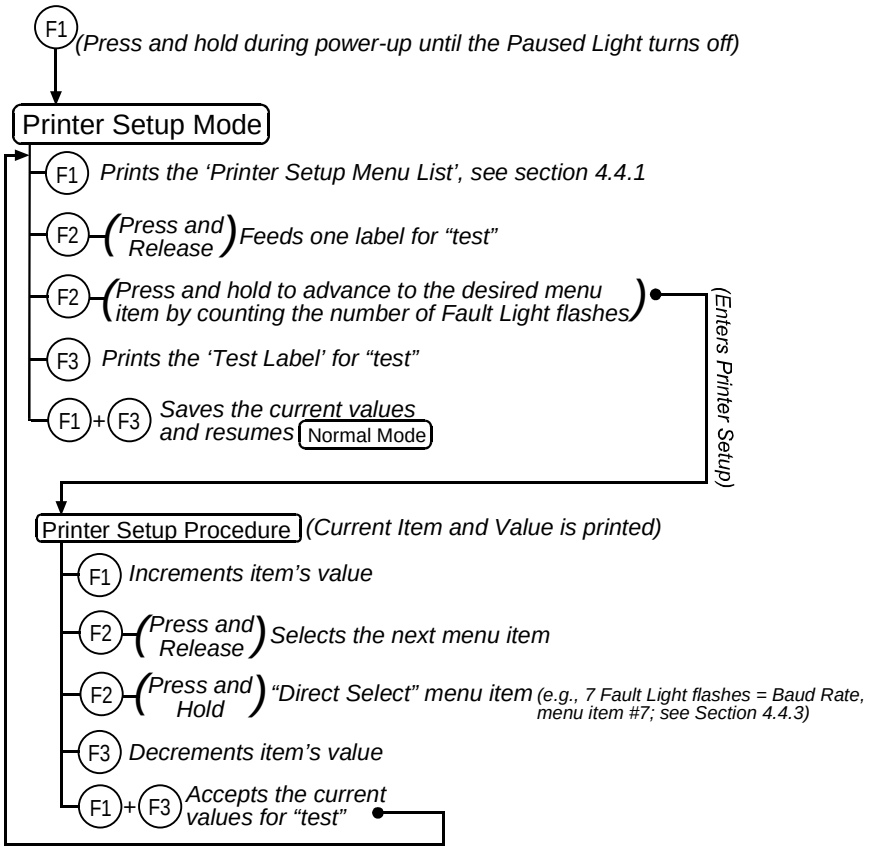
☑ **Notes:** It is recommended that the Printer Setup Mode not be entered while in Peel Mode or with the optional Present Sensor enabled. Depending on label size this can cause unpredictable results.

Printer and cutter faults are disabled during [Printer Setup Procedure], but can still occur while printing "test" labels.

If at any time you wish to discard your changes and revert back to the previous values, simply turn off power to the printer.

If you wish to restore Factory Defaults see Section 5.7.

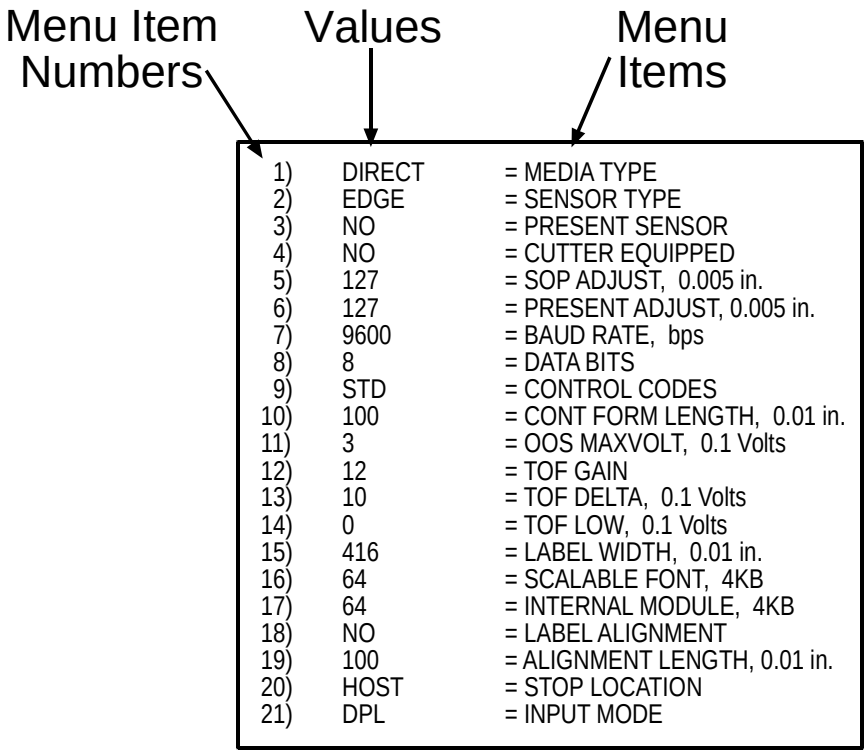
To change Printer Setup:


F1
(Press and hold during power-up until the Paused Light turns off)
Printer Setup Mode
F1 Prints the 'Printer Setup Menu List', see section 4.4.1
F2 (Press and Release) Feeds one label for "test"
F2 (Press and hold to advance to the desired menu item by counting the number of Fault Light flashes)
F3 Prints the 'Test Label' for "test"
F1 + F3 Saves the current values and resumes Normal Mode
(Enters Printer Setup)
Printer Setup Procedure (Current Item and Value is printed)
F1 Increments item's value
F2 (Press and Release) Selects the next menu item
F2 (Press and Hold) "Direct Select" menu item (e.g., 7 Fault Light flashes = Baud Rate, menu item #7; see Section 4.4.3)
F3 Decrements item's value
F1 + F3 Accepts the current values for "test"

4.4.1 Printer Setup Menu List

The Printer Setup Menu List label, shown below, contains the printer's current values for each menu item that can be modified via the front panel (See Section 4.4.2 for a detailed item description.)

The Menu Item Numbers correspond to the item's position in the Menu List for selection when pressing the F2 button during the Printer Setup Procedure (see Section 4.4). For example to "Direct Select" the BAUD RATE Menu Item press and hold the F2 button for 7 flashes of the FAULT Light or for the TOF GAIN item hold F2 for 12 flashes, etc.


Menu Item Numbers
Values
Menu Items
1) DIRECT = MEDIA TYPE
2) EDGE = SENSOR TYPE
3) NO = PRESENT SENSOR
4) NO = CUTTER EQUIPPED
5) 127 = SOP ADJUST, 0.005 in.
6) 127 = PRESENT ADJUST, 0.005 in.
7) 9600 = BAUD RATE, bps
8) 8 = DATA BITS
9) STD = CONTROL CODES
10) 100 = CONT FORM LENGTH, 0.01 in.
11) 3 = OOS MAXVOLT, 0.1 Volts
12) 12 = TOF GAIN
13) 10 = TOF DELTA, 0.1 Volts
14) 0 = TOF LOW, 0.1 Volts
15) 416 = LABEL WIDTH, 0.01 in.
16) 64 = SCALABLE FONT, 4KB
17) 64 = INTERNAL MODULE, 4KB
18) NO = LABEL ALIGNMENT
19) 100 = ALIGNMENT LENGTH, 0.01 in.
20) HOST = STOP LOCATION
21) DPL = INPUT MODE

☑ **Note:** When using narrow media, the 'Menu Items' column may be truncated.

4.4.2 Menu Items and Values

The table below details the Printer Setup Menu List items with a brief description of the item's function, and the possible values.

1) MEDIA TYPE	**2) SENSOR TYPE**
Sets printing for direct thermal (no ribbon) or thermal transfer (ribbon) media. ***Possible Values:*** * DIRECT THERMAL THERMAL TRANSFER	Selects the sensor type used to detect the media's Top Of Form (TOF) mark. ***Possible Values:*** * EDGE: gap / notch TOF marks REFL (Reflective): black marks CONT (Continuous): no TOF marks

3) PRESENT SENSOR	**4) CUTTER EQUIPPED**
Enables/Disables the optional Present Sensor feature. ***Possible Values:*** * NO YES	Enables/Disables the optional Media Cutter feature. ***Possible Values:*** * NO YES

5) SOP ADJUST	**6) PRESENT ADJUST**
Sets the start of print (SOP) location, relative to the top of form. ***Possible Values:*** Range: 0 – 255; default = *128 (0 = close to edge; 255 = farthest from edge)	Specifies an additional amount to feed the label after printing. ***Possible Values:*** Range: 0 – 255; default = *128 (0 = close to edge; 255 = farthest from edge)

7) BAUD RATE	**8) DATA BITS**
Sets the serial port baud rate. (Must match the host setting). ***Possible Values:*** 600 to 38.4k; default = *9600 BPS	Sets the serial data word length (Must match the host setting). ***Possible Values:*** * 8 7

9) CONTROL CODES

Allows code selection listed in Programmer's manual.

Possible Values:

* (STD) Standard Codes
(ALT) Alternate Codes

10) CONT FORM LENGTH

Sets the page (label) size when the 'SENSOR TYPE' is set to continuous media**.**

Possible Values:

Range: 0 – 9999; default = *100
(Units = .01 inch)

11) OOS MAXVOLT

Sets the media sensor level for the Out Of Stock condition.

Possible Values:

Range: 0 – 16; default = *2
(Units = .1 volt)

12) TOF GAIN

Sets media sensor Top of Form gain value.

Possible Values:

Range: 0 – 15; default = *10

13) TOF DELTA

Sets the minimum media sensor change required to signify a label gap or mark.

Possible Values:

Range: 0 – 50; default = *10
(Units = .1 volt)

14) TOF LOW

Sets the minimum media sensor reading for paper (gap/notch) or mark (reflective).

Possible Values:

Range: 0 – 50; default = *0
(Units = 0.1 volt)

15) LABEL WIDTH

Sets the label width.

Possible Values:

Range: 75 – 410; default = *410
(Units = .01 inch)

16) SCALABLE FONT

Sets the number of memory blocks to allocate for scalable fonts.

Possible Values:

Range: 0 – 128; default = *64
(Units = 4K Bytes)

17) INTERNAL MODULE

Sets the number of memory blocks to allocate for the internal RAM module.

Possible Values:

Range: 0 – 128; default[1] = *128
(Units = 4K Bytes)

[1] The E-4304 has a default value of 64.

18) LABEL ALIGNMENT

Sets the label alignment method *(see Section 4.5)*.

Possible Values:

YES (user manually determines 'ALIGN LENGTH')
AUTO (printer determines 'ALIGN LENGTH')
* NO (no Label Alignment used)

19) ALIGN LENGTH

Leading edge distance of two successive labels. Must be entered if 'LABEL ALIGNMENT' is set to Yes *(see Section 4.5)*.

Possible Values:

0 – 999; default =100*
(Units = .01 inch)

20) STOP LOCATION

Sets label stopping (and in certain cases the starting) location for different printer configurations.

Possible Values:

* HOST	(uses host values of 'SOP' and 'PRESENT ADJUST')
PEEL	(sets the stop location just behind the peel bar of the optional Peel Mechanism)
CUT	(sets stop location at the blade of the optional Media Cutter)
COVER	(sets stop location at the tear plate on the printer's cover)
NONE	(uses normal start location and ignores the host command)

21) INPUT MODE

Selects between the standard or template interpretation of incoming data.

Possible Values:

* DPL	(printer constructs the label using the standard DPL commands)
LINE	(printer constructs the label using a preloaded template form)

*** = Default Setting**

☑ **Note:** All of the menu items listed in the previous section are stored in non-volatile memory.

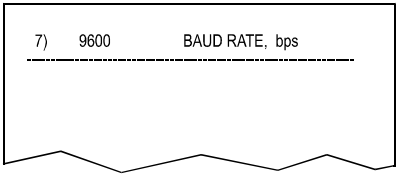
4.4.3 Step by Step Modification of the Printer Setup

The following is an example of Printer Setup modification. Although this example will detail how to modify the serial Baud Rate, the same method can be used to change any of the printer's menu item settings.

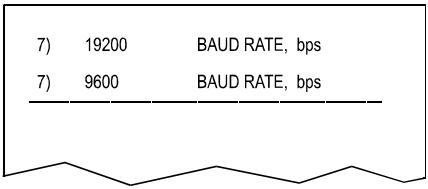
☑ **Note:** It is recommended that the Printer Setup Mode not be entered while in Peel Mode or with the optional Present Sensor enabled. Depending on label size this can cause unpredictable results.

1. With printer 'Off' and properly loaded with media, press and hold the (F1) button while powering 'On' the printer. Continue to hold the button until the PAUSED Light turns off, then release it.

2. Press and hold the (F2) button and count 7 flashes of the FAULT Light, then release it. The following printout should be produced:



3. Press the (F1) button one time to increment to the 19200 bps value. The following printout should be produced:

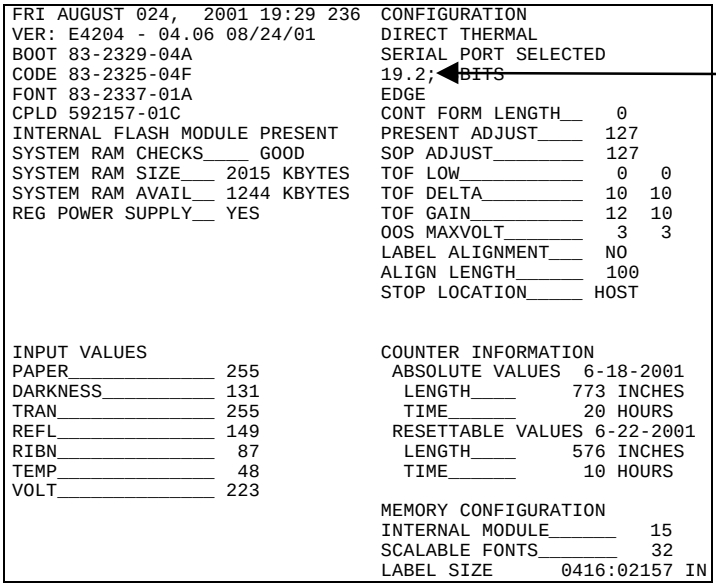


4. At this point you will accept the current values for "test" and exit the Printer Setup Procedure by simultaneously and briefly pressing the (F1)+(F3) buttons. Wait until the PAUSED Light goes off.

☑ **Note:** If you wish to discard your changes and revert back to the previous values simply turn off power to the printer before Step 5.

5. Now you can save your changes and resume [Normal Mode] by simultaneously and briefly pressing the (F1)+(F3) buttons. Wait until the PAUSED Light goes off.

6. To confirm that your changes have been made press the F2+F3 buttons simultaneously, this will print the Database Configuration Label. The label should show the new Baud Rate value of 19200.



4.5 Label Alignment

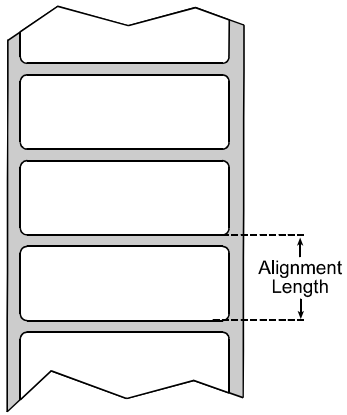
The Label Alignment function is intended for use when the label length is less than the distance between the printhead and the media sensor or where label waste at power-up is a concern. Label Alignment (see table below) is not recommended for label lengths greater than 6.5 inches or for media containing 2 or more form lengths.

Label Stock	Label Alignment Setting
Continuous	NO
6.5 inches or less	YES or AUTO
6.5 inches or more	NO
Multiple length labels	NO

The Label Alignment function is chosen via the menu system (see Section 4.4) or by host commands. The three possible modes, YES, AUTO, and NO, are detailed in the following sections.

4.5.1 Label Alignment = YES

In this mode, the operator must supply an 'ALIGN LENGTH' value. This value must be physically measured from leading edge to leading edge of two successive labels, as shown. The measurement must be as accurate as possible. For very short labels, errors as small as 0.01" can result in noticeable print variations on the labels between the media sensor and the printhead.



The measured value must be sent to the printer via the host computer or entered using the Printer Setup Mode (see Section 4.4).

Then, in Normal Mode, press and hold the FEED button (about 4 seconds). The printer will align the label to the top of form position.

☑ **Note:** If media with a different label length is subsequently loaded, the 'ALIGN LENGTH' must be recalculated and re-entered.

4.5.2 Label Alignment = AUTO

In this mode, the printer automatically calculates the 'ALIGN LENGTH' thus eliminating the need to physically measure the label. This mode is usually preferred in applications that require frequent media changes to labels of different lengths.

To perform an Auto Alignment, in Normal Mode press and hold the FEED button (about 4 seconds). The printer will feed labels to calculate the label length. Following the calculation, the printer will save the measurement and align to the top of form position. Auto Alignment can result in wasted labels during the measurement process (the longer the label length the greater the waste).

Auto Alignment with the Present Sensor enabled:

If the printer is equipped with the Present Sensor option and that feature is enabled, while the label length is calculated the printer will pause and illuminate the PAUSE Light after each movement. The operator must press the Pause Button for the alignment to continue. This allows the operator to remove any labels as required; however, labels should not be forcibly removed since they may not actually be positioned for removal, but at an interim position required for measurement.

4.5.3 Label Alignment = NO

When Label Alignment is not enabled (i.e., set to NO), printing begins at the current label position without alignment, assuming the label is at the start of print position. Additionally, if the label length is short, labels between the printhead and the media sensor may be unused.

4.5.4 Label Alignment Troubleshooting

If you experience label alignment problems, the following table offers possible causes and solutions.

Problem	Possible Cause	Solution
Attempting to perform Label Alignment results in no paper movement.	With the Present Sensor enabled, Label Alignment cannot be performed without a Label Length.	➢ Set Label Alignment to AUTO, press and hold FEED until media moves for the automatic length measurement. ***~OR~*** ➢ Re-measure the Label Alignment Length. Use Printer Setup mode to enter the new length. Print a Database Configuration label to ensure the new length has been set.

Problem	Possible Cause	Solution
First label is wasted during alignment. All labels thereafter print to the correct start of print position.	Alignment Length is too long. ***~OR~*** For labels whose length and stop position cause them to stop between labels on the media sensor, the alignment function can result in wasted labels.	➢ Set Label Alignment to AUTO, press and hold FEED until paper moves for automatic Label Alignment length measurement. ***~OR~*** ➢ Re-measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set. ➢ Obtain a slightly different label Alignment Length measurement. Using the Label Alignment AUTO mode, hold the FEED button to force an alignment and label measurement. Ensuring slack in the label stock may result in a slightly different measurement. The Alignment Length may also be set manually via the Setup Menu. Increasing or decreasing the value by 1 or 2 units (in./100) may help to prevent the wasted labels; however, this may result in incorrect print positions for labels that are short in length.

Problem	Possible Cause	Solution
Label Alignment is incorrect. Pressing FEED successively results in a short label length, one-inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00", and will result in this behavior when any larger label length is used without setting the appropriate length.	➢ Set Label Alignment to AUTO. Press and hold FEED until paper moves for automatic Label Alignment Length measurement. ***~OR~*** ➢ Measure the label length and use the Setup Menu to set the new length. Print a Database Configuration label to ensure the new length has been set.
Label Alignment is incorrect. Pressing FEED successively results in a label length longer than actual, one-inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00", and will result in this behavior when any larger label length is used without setting the appropriate length	➢ Set Label Alignment to AUTO. Press and hold FEED until paper moves for automatic Label Alignment length measurement. ***~OR~*** ➢ Measure the label length and use the Setup Menu to set the new length. Print a Database Configuration label to ensure the new length has been set.

Problem	Possible Cause	Solution
Tear Mode is selected but the label stop position (present position) is not far enough forward.	Another present position has been determined. Enabling the Present Sensor causes the label stop position (present position) to be approximately 0.1" behind the peel bar. ***~OR~*** The Present Adjust value is not correct.	➢ Disable the Present Sensor. ***~OR~*** ➢ Ensure the host computer is not providing a Present Distance shorter than is required for the Tear Bar. ➢ Use the Setup Menu to modify the Present Adjust value.
Tear Mode is selected but the label stop position (present position) is too far forward.	Another present position has been determined. ***~OR~*** The Present Adjust value is not correct.	➢ Ensure the host computer is not providing a Present Distance longer than is required for the Tear Bar. ➢ Use the Setup Menu to modify the Present Adjust value.
The FAULT Indicator illuminates during label alignment.	The label supply is empty	➢ Load media.

4.6 Calibration Mode – Button Functions

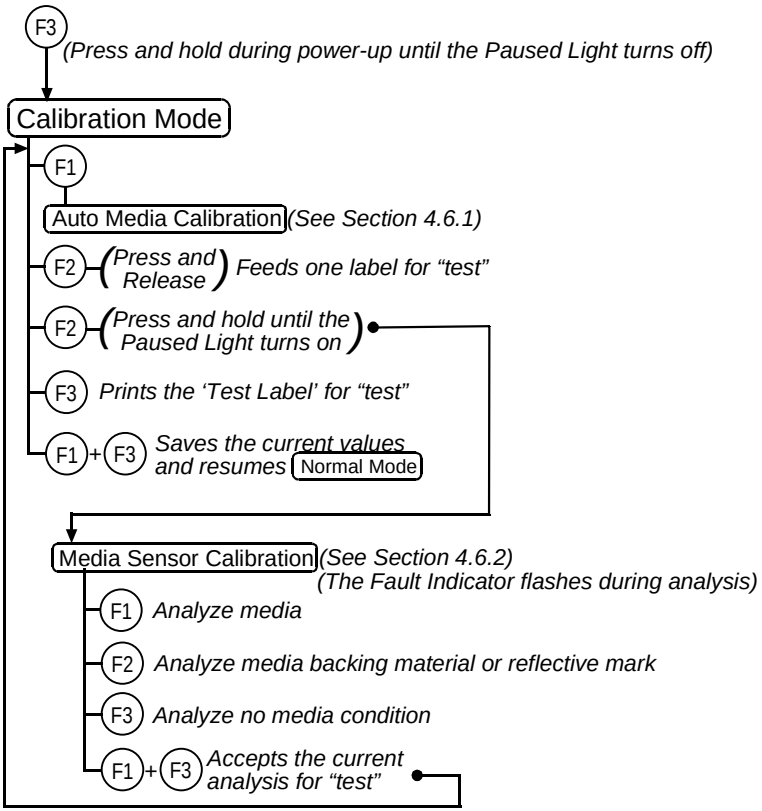
In 'Calibration' mode, the buttons allow the printer to adjust to the media being used. Calibration can be performed either automatically or manually, as detailed below.

☑ **Notes:** Before calibrating, ensure that the Printhead Carrier Assembly is latched down, that the cover is closed, and that the media sensor has been set for the appropriate media type, see Section 4.4.2.

Printer and cutter faults are disabled during [Auto Media Calibration] and [Media Sensor Calibration], but can still occur while printing "test" labels.

If at any time you wish to discard your changes and revert back to the previous calibration simply turn off power to the printer. Also, Factory Defaults can be restored, see Section 5.7

To perform Calibration:


F3
(Press and hold during power-up until the Paused Light turns off)
Calibration Mode
F1
Auto Media Calibration (See Section 4.6.1)
F2
Press and Release
Feeds one label for "test"
F2
Press and hold until the Paused Light turns on
F3
Prints the 'Test Label' for "test"
F1 + F3
Saves the current values and resumes Normal Mode
Media Sensor Calibration (See Section 4.6.2)
(The Fault Indicator flashes during analysis)
F1
Analyze media
F2
Analyze media backing material or reflective mark
F3
Analyze no media condition
F1 + F3
Accepts the current analysis for "test"

4.6.1 Auto Media Sensor Calibration

Auto Media Sensor Calibration automatically establishes the optimum sensing values for the media you are using in the printer.

☑ **Note:** Before calibrating, be sure the media sensor is set for the appropriate media type, see Section 4.4.2; also, ensure that the Printhead Carrier Assembly is latched down and the cover is closed.

To automatically calibrate the media sensor:

1. With the desired media loaded, hold the F3 button while powering up the printer. Continue to hold the button until the PAUSED Light turns off then release it.

3. Next press the F1 button. *The printer will feed approximately ten inches of media to calculate the TOF Delta and Low values to be used.*

4. Upon completion, one of the following Indicators will flash five times to denote the result of the auto calibration attempt:

   PAUSED Light = Successful calibration. Proceed to Step 5.

   FAULT Light = Unsuccessful calibration. Proceed to Section 4.6.2.

   ☑ **Note:** If you wish to discard the changes and revert back to the previous calibration simply turn off the printer before Step 5.

5. Now save the changes and resume Normal Mode by pressing the F1+F3 buttons simultaneously and briefly. Wait until the PAUSED Light goes off.

4.6.2 Manual Media Sensor Calibration

The Manual Media Sensor Calibration procedure should be used in cases where the printer continues to suffer from media sensing problems after performing or attempting to perform the Auto Media Sensor Calibration (see Section 4.6.1).

☑ **Note:**	Before calibrating, be sure the media sensor is set for the appropriate media type, see Section 4.4.2; also, ensure that the Printhead Carrier Assembly is latched down and the cover is closed.

To manually calibrate the media sensor:

1. Hold the F3 button and power-up the printer. Continue to hold the button until the PAUSED Light turns off; then release the button. Next, press and hold the F2 button, continue to hold the button until the PAUSED Light turns on; then release the button.

2. Place the media with the backing attached (if any) over the media sensor (see Section 3.2 for the sensor's location), close the Printhead Carrier Assembly, and then press the F1 button. *The printer will flash the FAULT Light as it analyzes the material.*

3. Position the backing material or the black (reflective) mark over the media sensor, close the Printhead Carrier Assembly, and then press the F2 button. *The printer will flash the FAULT Light as it analyzes the top of form mark.*

4. Remove all the material from the media sensor, close the Printhead Carrier Assembly, and then press the F3 button. *The printer will flash the FAULT Light as it analyzes the no media condition.*

5. Simultaneously and briefly press the F1 + F3 buttons to accept the calibration for "test" and exit the Media Sensor Calibration. One of the following Indicators will flash five times to denote the result of the manual calibration attempt:

   PAUSED Light = Successful calibration. Proceed to Step 6.

   FAULT Light = Unsuccessful calibration. Retry the procedure beginning at Step 1.

6. Use the F2 button (feeds a label), and the F3 button (prints a test label) to test the current calibration.

☑ **Note:** If you wish to discard the changes and revert back to the previous calibration simply turn off the printer before Step 7.

7. Now save the changes and resume Normal Mode by pressing the F1+F3 buttons simultaneously and briefly. Wait until the PAUSED Light goes off.

4.7 Internal Labels

The following section details the printer's internally generated configuration and test labels.

4.7.1 Database Configuration and Dot Check Labels

The Database Configuration Label provides valuable printer information including the firmware version, memory allocations, enabled options, and label-counter data.

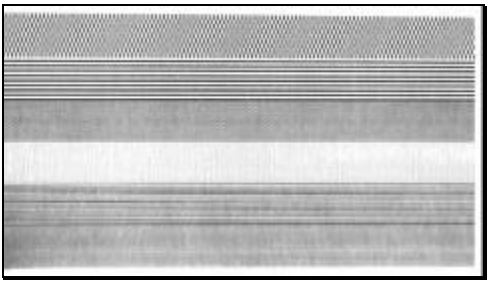
To print the Database Configuration and Dot Check Labels:

With the printer on, loaded with media (at least 4 inches wide) and ribbon (if printing with thermal transfer media), press the F2+F3 buttons simultaneously.

The first label printed will be the Database Configuration Label.

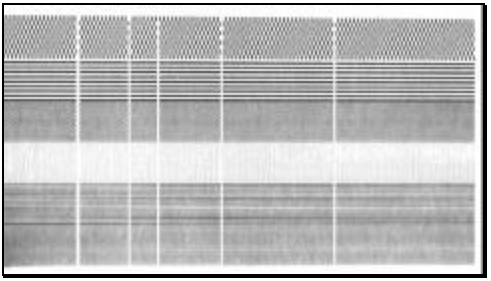
```
FRI AUGUST 024,  2001 19:29 236   CONFIGURATION
VER: E4204 - 04.06 08/24/01       DIRECT THERMAL
BOOT 83-2329-04A                  SERIAL PORT SELECTED
CODE 83-2325-04F                  19.2; 8BITS
FONT 83-2337-01A                  EDGE
CPLD 592157-01C                   CONT FORM LENGTH__    0
INTERNAL FLASH MODULE PRESENT     PRESENT ADJUST____  127
SYSTEM RAM CHECKS____ GOOD        SOP ADJUST_______   127
SYSTEM RAM SIZE___ 2015 KBYTES    TOF LOW__________     0   0
SYSTEM RAM AVAIL__ 1244 KBYTES    TOF DELTA________   10  10
REG POWER SUPPLY__ YES            TOF GAIN_________   12  10
                                  OOS MAXVOLT______    3   3
                                  LABEL ALIGNMENT___  NO
                                  ALIGN LENGTH_____   100
                                  STOP LOCATION_____ HOST


INPUT VALUES                      COUNTER INFORMATION
PAPER_____________ 255             ABSOLUTE VALUES  6-18-2001
DARKNESS__________ 131               LENGTH____      773 INCHES
TRAN______________ 255               TIME______       20 HOURS
REFL______________ 149             RESETTABLE VALUES 6-22-2001
RIBN______________  87               LENGTH____      576 INCHES
TEMP______________  48               TIME______       10 HOURS
VOLT______________ 223
                                  MEMORY CONFIGURATION
                                  INTERNAL MODULE_____   15
                                  SCALABLE FONTS______   32
                                  LABEL SIZE      0416:02157 IN
```

The second label printed is the Dot Check Label. This label is used to test the condition of the printhead, as shown below:



Good Dot Check Label:

Even pattern consistency indicates that the printhead is operating normally.



Faulty Dot Check Label:

Streaks in the patterns indicate a dirty or faulty printhead (see Chapter 5).

4.7.2 Test Label

The Test Label is used to evaluate the current printer setup for print quality, label tracking, and print positioning.

To print the Test Label:

With the printer loaded with media (at least 4 inches wide), and ribbon (if printing with thermal transfer media), simultaneously press the (F1) + (F2) buttons.

4.7.3 Hex Dump Label

The Hex Dump Label is a useful tool in the diagnosis of problems including communications handshaking and DPL syntax errors. To generate a Hex Dump Label the printer enters into Hex Dump Mode. In this mode, all data sent to the printer will be immediately output in hexadecimal code, along with the printable ASCII equivalents. To decode this information, the *E Class Programmer's Manual* is an essential reference. As a final note, many software programs use bit mapping to construct the label, making diagnosis of this data difficult. Contact Datamax Technical Support with any questions.

To print the Hex Dump Label:

With the printer on, loaded with media (at least 4 inches wide) and ribbon (if printing with thermal transfer media), press and hold the (F2) button while turning the printer on. Continue holding the (F2) button until the PAUSED Light turns off. Now, all data received by the printer will be output in hexadecimal code, as shown below.

```
0000  02 4C 0D 44 31 31 0D 31  ^L.D11.1
0008  36 31 31 30 30 30 30 33  6110000003
0010  32 30 30 30 31 30 46 4F  200010FO
0018  4E 54 20 36 3A 20 41 4C  NT 6: AL
0020  4C 20 56 41 4C 49 44 20  L VALID
0028  20 20 20 20 20 20 20 20
0030  20 20 20 0D 31 36 31 31     .1611
0038  30 30 30 30 32 38 30 30  0000280O
0040  30 31 30 20 20 20 20 20  010
0048  20 20 20 43 48 41 52 41     CHARA
0050  43 54 45 52 53 3A 0D 31  CTERS:.1
0058  36 31 31 30 30 30 30 32  6110000002
0060  34 30 30 30 31 30 23 24  400010#$
0068  25 26 28 29 2A 2B 2E 2D  %&()*+.-
```

To exit the Hex Dump Mode:

Turn the printer off.

Maintenance and Adjustments

5.0 Introduction

This chapter details the cleaning, adjusting, and troubleshooting tips for the printer. The following table outlines the recommended maintenance schedule for the various printer parts.

Area	Method	Interval
Printhead	Turn off the printer before cleaning the printhead. Use solvent* on a cotton swab to clean the printhead from end to end.	After every roll of media.
Platen Roller	Turn the power off. Rotate the platen roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Peel-Off Roller	Rotate the peel-off roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Media Path	Solvent*	After every roll of media.
Peel/Tear Bar	Solvent*	As needed
Media Sensor	Air blow	Monthly
Exterior	Mild detergent or desktop cleaner.	As needed
Interior	Brush or vacuum cleaner	As needed.

* It is recommended that a solvent containing isopropyl alcohol be used.

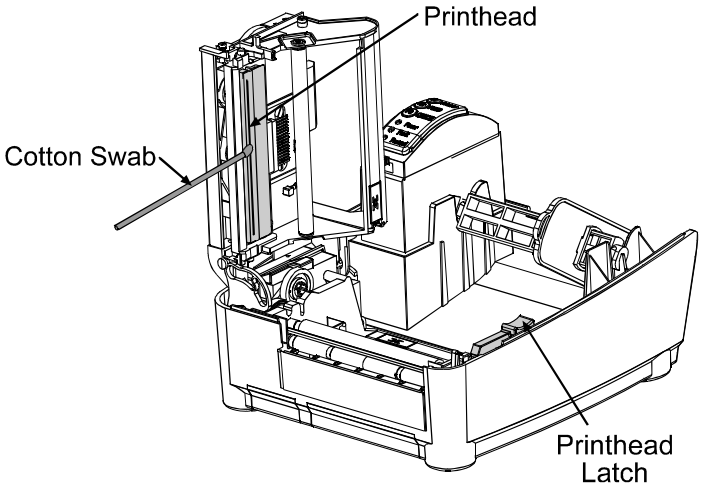
Warning

Isopropyl alcohol is a flammable solvent, always take the proper precautions when using this substance.

5.1 Cleaning the Printhead

Warning Turn 'off' the printer and unplug the unit from the AC outlet before cleaning the printhead.

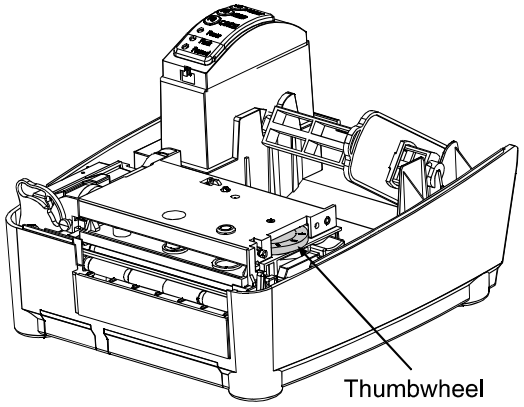
1. Turn 'off' the printer and open the cover.
2. Push the Printhead Latch down and raise the Printhead Carrier Assembly. Allow the Printhead to cool.
3. Using a Cotton Swab dipped in isopropyl alcohol, rub the Cotton Swab along the Printhead.



5.2 Media Width Adjustment

A Thumbwheel on the side of the Printhead Carrier Assembly allows the printhead to be adjusted for various sizes of media. When adjusting for narrow media move the Thumbwheel to the left (clockwise); conversely, when adjusting for wide media move it to the right (counterclockwise).

☑ **Note:** The numbers on the Thumbwheel are for reference only and do not correspond to specific media widths.

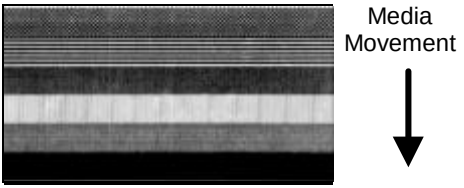


To perform the media width adjustment:

1. Load media into the printer. Print a label (press the F2+F3 buttons simultaneously) and examine it.

2. If the printing appears too light on the right-hand side of the label (see example below), then move the Thumbwheel to the right (counterclockwise). Print another label and examine it, making additional adjustments as necessary.

The light print on the right side of this Dot Check Label indicates that the Thumbwheel should be adjusted to the right.



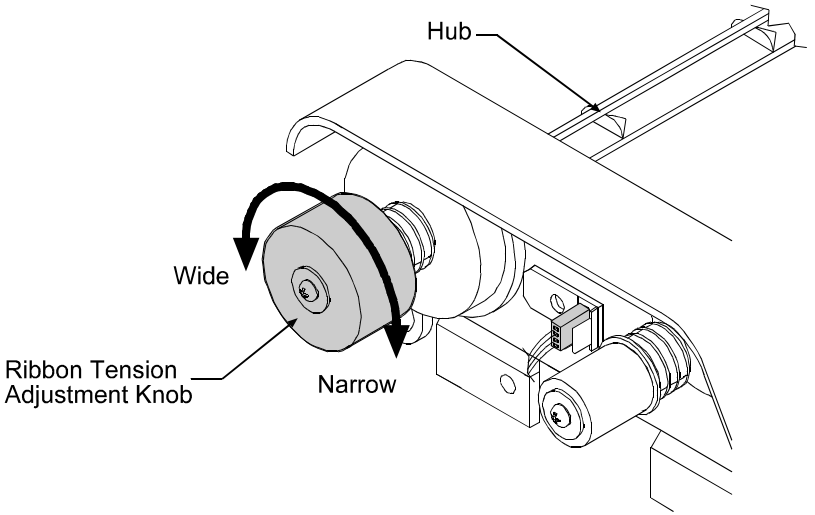
☑ **Note:** If the media begins tracking to the right while printing, the Thumbwheel should be adjusted to the left (clockwise).

5.3 Ribbon Width Adjustment

The adjustable ribbon handler feature, found on printers equipped with the thermal transfer option, allows the optimum amount tension to be supplied by the ribbon supply hub. To adjust:

1. Turn ‘off’ the printer.

2. Hold the Hub and then rotate the Ribbon Tension Adjustment Knob to meet your media/ribbon width based on the table below. Ensure that the Ribbon Tension Adjustment Knob is turned fully to the clockwise or counterclockwise position. (The knob will no longer turn once it is in the proper position; do not force or over turn this knob.)

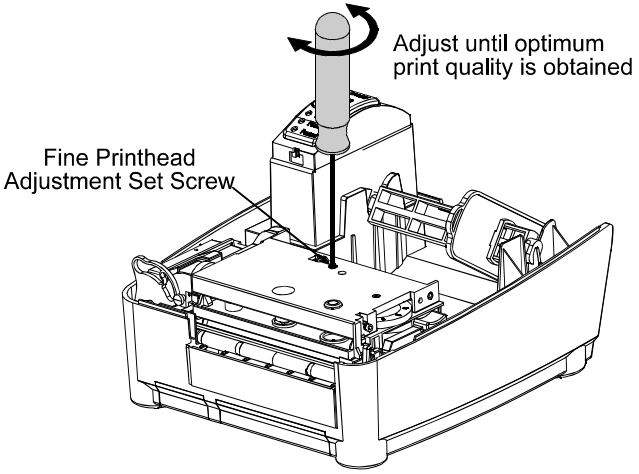


Ribbon Size	Ribbon Width	Direction of Rotation
Narrow	1 - 2 inches	Clockwise
Wide	2 - 4 inches	Counterclockwise

5.4 Fine Printhead Adjustment

The Fine Printhead Adjustment Set Screw, located on top of the printhead carrier assembly, is used for adjusting print quality. This adjustment is set at the factory and should not need further adjustment; however, with the different types and thickness of media some re-adjustment may be necessary if print quality suffers.

To adjust the printhead, turn the Set Screw until optimum print quality is obtained (some trial and error may be necessary). Do not over tighten the Set Screw.



☑ **Note:** If thermal transfer equipped, it is not necessary to remove the Ribbon Handler Assembly; an access hole is provided.

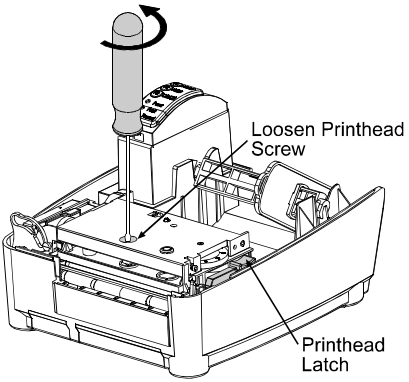
5.5 Printhead Replacement

Removal:

☑ **Notes:** Always follow proper Electro Static Discharge procedures when replacing the printhead.

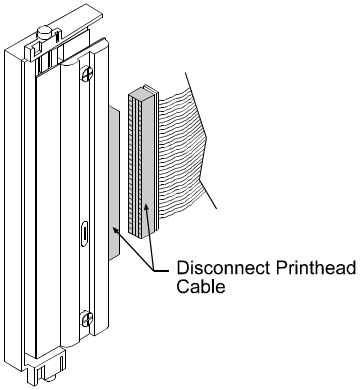
If thermal transfer equipped, it is not necessary to remove the Ribbon Handler Assembly; an access hole is provided.

1. Turn off the printer.



2. Loosen the Printhead Screw until it is free from the printhead. Carefully unlatch the printhead carrier assembly and remove the printhead.

3. Remove the printhead cable from the back of the printhead.



Replacement:

1. Connect the printhead cable to the new printhead.
2. Position the printhead in the printhead carrier assembly, ensure that the printhead cable is not pinched, and then tighten the Printhead Screw.
3. Clean the Printhead (see Section 5.1) and allow it to dry before use.
4. Use the Darkness Adjustment to match the print contrast of the new printhead to that of the old printhead (see Section 5.6).

5.6 Darkness Adjustment

The Darkness Adjustment (located on the rear of the printer) allows the operator to match the print contrast following a printhead replacement. Turning the Darkness Adjustment clockwise will darken the print, while turning it counterclockwise will lighten the print. Compare a label printed with the old printhead and make this adjustment so that the new printhead matches the darkest portion of that label.

☑ **Note:** Large increases in the 'Darkness Adjustment' can shorten printhead life. If you need to increase the darkness of the printed labels, increase the Heat value and/or slow the Print Speed using your software program or via DPL commands.

5.7 Resetting to the Factory Defaults

With the printer power 'Off,' press and hold the F1, F2, and F3 buttons while turning 'On' the printer. Continue to hold the buttons down until the PAUSED Light turns off. The printer will now be set to the 'Factory Defaults.' See Section 4.4.1 for a listing of the factory default settings.

5.8 Downloading Firmware and Fonts

The operating programs and fonts for the printer are stored in Flash memory on the Main PCB. When program updates and/or new features are added, they can be downloaded to the printer as follows:

1. Identify the new version for your model of printer from the Datamax FTP site at ftp://ftp.datamaxcorp.com and download it onto your computer's hard drive or a floppy disk.

2. Ensure that the printer is connected to the host and that the power is 'On.' Using the DOS copy command enter:

```
copy filename.dlf lpt1/b
```

☑ **Note:** Other programs (e.g., hyper-terminal and certain Windows® Driver programs) may also be used to download this file.

3. The PAUSED Light will flash during the download.

4. **Following a successful download**, the PAUSED Light will illuminate then the printer will perform a 'cold reset.' The previous printer setup will not be affected unless substantial firmware data structure changes have occurred. Print a Database Configuration Label to verify your new firmware version.

   - **Following an unsuccessful download**, the FAULT Light will illuminate then the printer will perform a 'warm reset' (both the POWER and PAUSED Light will be on during power-up initialization). The original firmware will remain operational. If the printer fails to reset, toggle the power 'Off' and 'On.'

     Try re-sending the file to the printer. If the failure continues, check the following possible causes:

     - An invalid or corrupted file is being downloaded - Ensure the file being downloaded is correct and applicable for your printer model.
     - Possible communications error - Check the cable connection between the host and printer and ensure that a quality, shielded cable is used.
     - Possible Flash memory problem - Call for service.

     If the printer fails to boot-up after an unsuccessful download, turn 'Off' the power. Simultaneously press and hold the F1 and F3 buttons while powering 'On' the printer. Now, try downloading the file to the printer.

Troubleshooting

6.0 Introduction

Occasionally, situations arise that require troubleshooting. Possible problem situations and potential solutions are listed in this section. While not every situation is addressed, you may find some of these tips helpful. After the correction action is taken press the FEED button to clear the alarm. Contact a qualified service technician for problems that persist or are not covered in this section.

6.1 Troubleshooting Tips

The following table lists the symptoms and the associated page numbers of the topics covered in the troubleshooting section.

Problem Situation	Page
Unacceptable print quality	50
The printer does not print or prints several labels at once	50
The ribbon does not advance	50
Skips every other label	51
Unable to print in rotation 4	51
Prints light on the right side of the label	51
Printer fails to turn on	51
Label advances 1-2 inches before a fault indication	52
Label advances 16 inches before a fault indication	52
Tracking Problems	52

Unacceptable print quality

- Dirty printhead: Clean the printhead (see Chapter 5).
- The temperature setting may be incorrect for the media being used: Use the software program or DPL commands adjust the Heat Setting and Print Speed.
- A mismatched incorrect ribbon/media combination is being used: Check the types being used.
- Verify that the Media Type Switch is in the correct position for the printing method being used (see Section 3.4).
- Faulty printhead: Replace it (see Chapter 5) or call for service.

The printer does not print or prints several labels at once:

- The labels are incorrectly loaded: See the loading instructions on the inside cover of the printer or Chapter 3.
- The media is not calibrated: Calibrate it (see Chapter 4).
- If equipped, the Adjustable Media Sensor may need to be repositioned (see Chapter 3).
- The media sensor or sensor circuitry may be defective: Call for service.

The ribbon does not advance

(The paper advances, but ribbon does not).

- The ribbon may be installed incorrectly: Ensure that the ribbon's inked side faces the paper. With most ribbons this can be verified by rubbing paper against the ribbon; the ink should smudge the paper. Or, if using label stock, the sticky side of a label will pull off the ink.
- A mismatched ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon: Ensure that the correct type of ribbon is being used with the media.

Skips every other label

(Print quality is good, but every other label is skipped).

- The label is formatted too close to the top edge of the label: Leave white space equal to 8-dot rows (about .02 inch [.5mm]) at the top of the label.
- The media is not calibrated: Calibrate it (see Chapter 4).
- If equipped, the Adjustable Media Sensor may need to be repositioned (see Chapter 3).
- The media sensor or media sensor circuitry may be defective: Call for service.

Unable to print in rotation 4

- The characters are formatted outside the dimensions of the label: Check that the row/column values provide enough room for the height of the image being printed.

Prints light on the right side of the label

- The media width adjustment is set for a narrower media width than is actually being used: Adjust for the media width (see Chapter 5).
- The printhead is not properly aligned: Call for service.
- The printhead carrier assembly is not latched down: Latch it.

Printer fails to power on

- The AC wall outlet may be faulty: Try another outlet.
- A fuse may be blown: Call for service.
- The power supply may be faulty: Replace it.
- A defective power switch may exist on the printer: Call for service.

Label advances 1-2 inches before a fault indication

- The ribbon may be incorrectly installed. Ensure that the ribbon's inked side faces the paper. With most ribbons this can be verified by rubbing paper against the ribbon; the ink should smudge the paper. Or, if using label stock, the sticky side of a label will pull off the ink.
- A mismatched ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon: Ensure that the correct type of ribbon is being used with the media.

Label advances 16 inches before a fault indication

- The media may not be properly loaded: Reload it (see Chapter 5). When loading media ensure that the media hub and media guide are against the media and that gaps or marks in the labels are in line with the media sensor.
- If equipped, the Adjustable Media Sensor may need to be repositioned (see Chapter 3).
- The media sensor or media sensor circuitry may be defective: Call for service.

Tracking Problems

- The media may not be properly loaded: Reload it (see Chapter 5). When loading media ensure that the media hub and media guide are against the media and that gaps or marks in the labels are in line with the media sensor.
- The media width adjustment may not be properly set: Readjust for the label width (see Chapter 5).

Specifications

Mechanical

Width	8.5” (21.6 cm)
Depth	9.5” (24.1 cm)
Height	6.25” (15.9 cm)
Weight	4 lbs. (1.8 kg)
Operating Temperature	40° F to 95° F (4° C to 35° C)
AC Input Voltage	110V Standard (Non Auto-Ranging) (50-2024-01); 105 to 125, 60 Hz 220V Standard (Non Auto-Ranging) (50-2034-01); 210 to 250, 50 Hz Standard (Auto-Ranging) (50-2050-01); 100 to 240, 50-60 Hz Heavy Duty (Auto-Ranging) (50-2049-01); 105 to 250, 50-60 Hz

Printing

Print Method	Direct Thermal; Thermal Transfer (optional)
Print Speed	*E-4203:* 1 - 4 IPS (25.4 - 101.6 mm/s); *4IPS requires optional power supply.* *E-4204 & E-4304:* 1 - 4 IPS (25.4 - 101.6 mm/s)
Resolution	*E-4203 & E-4204:* 203 dpi (8 dots/mm) *E-4304:* 300 dpi (11.8 dots/mm)
Tear Bar	Tear up
DRAM Memory	2MB
FLASH Memory	1MB

Media/Ribbon

Media Types	Roll-Fed, Die-Cut, Continuous, Fan-Fold
Max. Media Width	4.3" (109.2 mm)
Min. Media Width	1" (25.4 mm)
Max. Print Width	4.09" (104 mm)
Print Length Range	.375 - 24" (9.52-609.6 mm)
Media Thickness Range	.0025 - .01" (.064 mm - .254 mm); *up to .007" (.117 mm) with optional Cutter*
Media Supply Roll Capacity	*E-4203:* 4" (101.6 mm) O.D. on 1" (25.4 mm) core *E-4204 & E-4304:* 5" (127.0 mm) O.D. on 1" (25.4 mm) core
Ribbon Width Range	1.0 - 4.3" (25 - 110 mm)
Ribbon Roll Capacity	Matched to media: approx. 361' (110 m) long with a 1.5 inch (38 mm) O.D. on a .5 inch core

Communications

Interface	RS-232 (DB-9), and Centronics Parallel
Baud Speed	600 to 38,400 bits per second (BPS)
Handshaking	Xon/Xoff, CTS, DTR
Parity	Even, Odd, or None
Stop Bits	1 or 2
Data Bits	7 or 8

Fonts

9 Bit Map Fonts; rotated 0, 90, 180, 270 degrees.

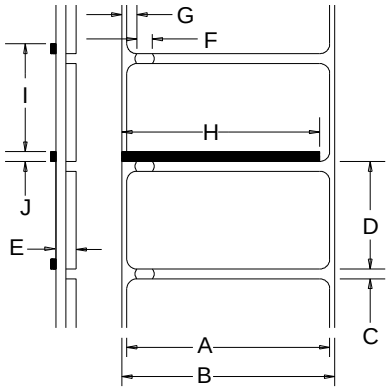
Embedded Bar Codes

Code 39, Interleaved 2 of 5,Code 128 A, B & C, Codabar, LOGMARS, UPC-A, UPC-E, UPC 2&5, EAN-8, EAN-13, EAN 2&5, UPC Random Weight, Code 93, Plessey, USCS, Code 128 MOD 43, Postnet, Uss/EAN-128 Random Weight, Telepen, UPS Maxicode, PDF417, DataMatrix, Aztec, QR Code, MicroPDF417, and TLC39

Approved Media

To achieve optimum print quality and maximum printhead life, Datamax specifies the use of *DATAMAX*® brand media and ribbons. These supplies are specially formulated for use in our printers; use of non-Datamax supplies may affect the print quality, performance, and life of the printer or its components.

For a current list of approved media and ribbons for use in direct thermal and thermal transfer applications, please contact a Media Representative at (407) 523-5650.



Designator	Description	Maximum[1]	Minimum[1]
A	Label width	4.09	1.00
B	Backing width	4.30	1.00
C	Gap between labels	.25	.10
D	Label length	24[3]	.375[4]
E	Total thickness	.010	.0025
F	Notch opening width	.50	.20
G	Distance from the edge of the media to the media sensor aperture (left justified)	.175	.125
	with the Adjustable Media Sensor option	2.94	.125
H	Reflective mark width[2]	4.10	.50
I	Distance between reflective marks	24[3]	.375[5]
J	Reflective mark length	.25	.10

[1] Units of measure are in inches.

[2] The reflective (black) mark must be carbon based, placed on the backside of the stock, and the reflectance shall be less than 10% at wavelengths of 950 and 640 nm.

[3] The label length may vary up to 99 inches with printable area not exceeding the maximum label length.

[4] This distance is inclusive of the minimum gap between labels.

[5] This distance is inclusive of the minimum reflective mark.

Appendix A

ASCII Control Code Chart

	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ctrl @	NUL	0	00		32	20	@	64	40	`	96	60
Ctrl A	SOH	1	01	!	33	21	A	65	41	a	97	61
Ctrl B	STX	2	02	“	34	22	B	66	42	b	98	62
Ctrl C	EXT	3	03	#	35	23	C	67	43	c	99	63
Ctrl D	EOT	4	04	$	36	24	D	68	44	d	100	64
Ctrl E	ENQ	5	05	%	37	25	E	69	45	e	101	65
Ctrl F	ACK	6	06	&	38	26	F	70	46	f	102	66
Ctrl G	BEL	7	07	‘	39	27	G	71	47	g	103	67
Ctrl H	BS	8	08	(	40	28	H	72	48	h	104	68
Ctrl I	HT	9	09	)	41	29	I	73	49	i	105	69
Ctrl J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl [	Esc	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl \	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl ^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl _	US	31	1F	?	63	3F	_	95	5F		127	7F

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ç	128	80	á	160	A0		192	C0	Ó	224	E0
ü	129	81	í	161	A1		193	C1	ß	225	E1
é	130	82	ó	162	A2		194	C2	Ô	226	E2
â	131	83	ú	163	A3		195	C3	Ò	227	E3
ä	132	84	ñ	164	A4		196	C4	õ	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
å	134	86	ª	166	A6	ã	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	Þ	232	E8
è	137	89	®	169	A9		201	C9	Ú	233	E9
è	138	8A		170	AA		202	CA	Û	234	EA
ï	139	8B	1/2	171	AB		203	CB	Ù	235	EB
î	140	8C	1/4	172	AC		204	CC	´y	236	EC
ì	141	8D	¡	173	AD		205	CD	´Y	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F	¯	175	AF		207	CF		239	EF
É	144	90		176	B0	Ò	208	D0		240	F0
Æ	145	91		177	B1	D	209	D1	±	241	F1
Æ	146	92	2	178	B2	Ê	210	D2		242	F2
ô	147	93	3	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	È	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	À	183	B7	Î	215	D7	¸	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	°	248	F8
Ö	153	99	1	185	B9		217	D9	¨	249	F9
Ü	154	9A		186	BA		218	DA	·	250	FA
Ø	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
Ø	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	Ì	222	DE		254	FE
f	159	9F		191	BF		223	DF	€	255	FF

☑ **Notes:** For the hardware handshake XON/XOFF commands:

XON = Ctrl Q (DC1)
XOFF = Ctrl S (DC3)

The Euro € character has been added to the table above at 255 (FF) as a Datamax standard for resident bit-mapped fonts 0,1,2,3,4,5,6, and 9 (CG Triumvirate).

Appendix B

Embedded Fonts and Barcodes

All character fonts and barcodes available with the printer are described in this section. Each font and barcode has a name associated with it for use in programming. Human-readable fonts have numeric names while barcode fonts have alpha names.

Fonts

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the alphabetic O. The slash can be removed with the label formatting command Z. These fonts are non-proportional (monospaced): all of the characters take up the same amount of space when printed.

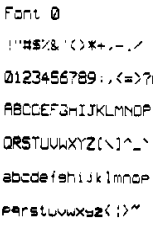
The Triumvirate font number 9 is a proportional font; each character will take up a different amount of space when printed.

Font	Valid ASCII Characters (decimal)	Use with Record Structure Type
0	32-127,255	Internal Bit-Mapped Fonts
1	32-168, 171, 172, 225,255	
2	32-168, 171, 172, 225,255	
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
7	32-126	
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90	
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224-237, 241, 243, 246-250,255	Smooth Font
9	Dependent upon selected symbol set; see the Programmers Manual.	Downloadable Scalable Font

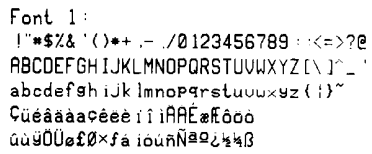
The table below lists the font sizes. The numbers indicate the number of dots.

FONT	HEIGHT	WIDTH	SPACING
Font 0	7	5	1
Font 1	13	7	2
Font 2	18	10	2
Font 3	27	14	2
Font 4	36	18	3
Font 5	52	18	3
Font 6	64	32	4
Font 7	32	15	5
Font 8	28	15	5

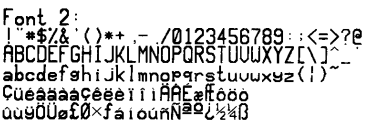
Font 0 96-character alphanumeric, upper and lower case.



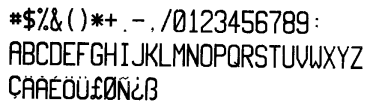
Font 1 145-character upper and lower case alphanumeric w/ descenders and ascenders.



Font 2 138-character alphanumeric, upper and lower case.



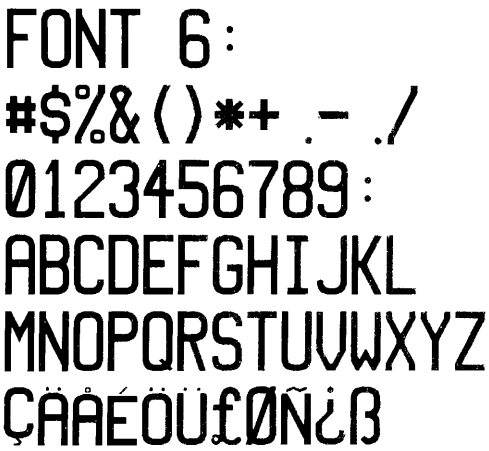
Font 3 62-character alphanumeric, uppercase.



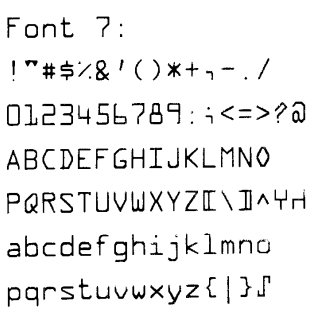
Font 4 62-character alphanumeric, uppercase.

Font 5 62-character alphanumeric, uppercase.

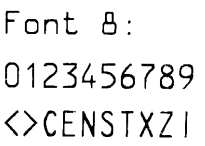
Font 6 62-character alphanumeric, uppercase.



Font 7 OCR-A, size I.



Font 8 OCR-B, size III.



Font 9 Internal Triumvirate font.
Point sizes are selected by the number in the barcode height.
Larger point sizes can be obtained by increasing the height and width multipliers, 48pt and 72pt fonts are generated by doubling the 24pt and 36pt fonts respectively (see the *E-Class Programmer's Manual* for more information).

Barcodes

Bar Code fonts have alpha names (left column in the table below). Uppercase alpha names will print barcodes with human-readable interpretations. Lowercase alpha names will print barcodes only. The table is followed by visual samples.

Bar Code ID	Type	Length	Check-sum	Valid ASCII Characters, decimal value representation
A / a	Code 3 of 9	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B / b	UPC-A	11	Yes	48-57 Numeric only Option V used in the 6th & 7th position
C / c	UPC-E	6	Yes	48-57 Numeric only
D / d	Interleaved 2 of 5 (I 2 of 5)	Varies	No	48-57 Numeric only
E / e	Code 128	Varies	M-103	32-127
F / f	EAN-13	12	Yes	48-57 Numeric only. Option V used in the 7th & 8th position
G / g	EAN-8	7	Yes	48-57 Numeric only
H / h	Health Industry Bar Code	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I / i	Codabar	Varies	No	36, 43, 45-58, 65-68
J / j	I 2 of 5 with modulo 10 checksum	Varies	M-10	48-57 Numeric only
K / k	Plessey	Up to 14	M-10	48-57 Numeric only. Option + is Last Character for Second M-11 checksum
L / l	I 2 of 5 with modulo 10 checksum & bearer bars	13	M-10	48-57 Numeric only
M / m	2 digit UPC addendum	2	Yes	48-57 Numeric only
N / n	5 digit UPC addendum	5	Yes	48-57 Numeric only
O / o	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only
Q / q	UCC/EAN Code 128	19	Yes	48-57 Numeric only
R / r	UCC/EAN Code 128 K-Mart NON EDI bar code	18	Yes	48-57 Numeric only
S / s	UCC/EAN Code 128 Random Weight	34 +	Yes	48-57 Numeric only
T / t	Telepen	Varies	Yes	Alphanumeric
U	UPS MaxiCode	84	Yes	Alphanumeric

Bar Code ID	Type	Length	Check-sum	Valid ASCII Characters, decimal value representation
u	UPS MaxiCode with Byte Count	Specified	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF417	Varies	Yes	All
Z	PDF417 with Byte Count	Specified	Yes	All
W1c	DataMatrix	Varies	Yes	All 8-bit values
W1C	DataMatrix with Byte Count	Specified	Yes	All 8-bit values
W1d	QR Code – Auto format	Varies	Yes	Alphanumeric
W1D	QR Code – Manual format	Varies	Yes	Single-byte or Kanji double-byte
W1f	Aztec	Varies	Yes	All 8-bit values
W1F	Aztec with Byte Count	Specified	Yes	All 8-bit values
W1T	TCIF Linked Barcode 3 of 9 (TLC39)	Varies	No	Alphanumeric
W1z	MicroPDF417	Varies	Yes	All 8-bit values
W1Z	MicroPDF417 with Byte Count	Specified	Yes	All 8-bit values

Barcode A Code 3 of 9

Barcode B UPC-A

Barcode C UPC-E

Barcode D Interleaved 2 of 5

Barcode E Code 128

Barcode F EAN-13

Barcode G EAN-8

Barcode H Health Industry Barcode (HIBC)

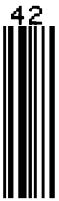
Barcode I Codabar

Barcode J Interleaved 2 of 5 w/module 10 checksum

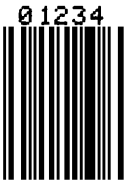
Barcode K Plessey

Barcode L Interleaved 2 of 5 w/module 10 checksum and shipping bearer bars

Barcode M 2 Digit UPC addendum



Barcode N 5 Digit UPC addendum

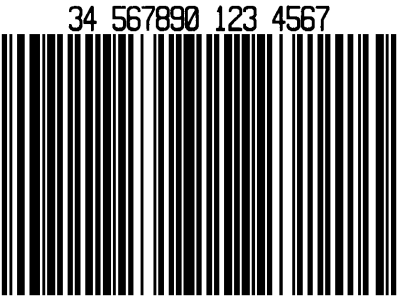


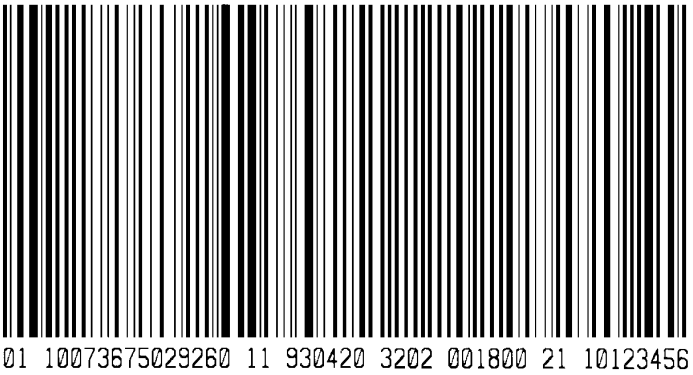
Barcode O Code 93

Barcode p Postnet

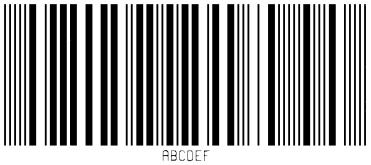
Barcode Q UCC/EAN Code 128

Barcode R UCC/EAN Code 128 KMART NON EDI

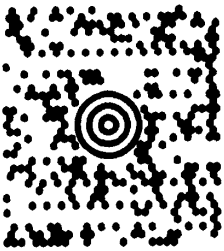




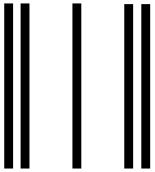
Barcode S UCC/EAN Code 128 Random Weight



Barcode T Telepen



Barcode u UPS MaxiCode



Barcode v FIM

Barcode z PDF417

Bar Code W1c: DataMatrix

Bar Code W1d: QR Code

Bar Code W1f: Aztec

Bar Code W1z: MicroPDF417

Bar Code W1T: TCIF Linked Barcode 3 of 9 (TLC39)

Appendix C

Datamax Barcode Products Limited Warranty Statement

E-Classä 4203/4204/4304 Printer

Printer

Datamax warrants to Purchaser that under normal use and service, the E-Class™ 4203/4204/4304 Printer, (with the exception of the thermal printhead) purchased hereunder shall be free from defects in material and workmanship for a period of (365) days from the date of shipment by Datamax.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts which have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead

This warranty is limited to a period of one year, (365 days), or 1,000,000 linear inches of use, whichever comes first, for the E-Class™ 4203/4204/4304 thermal printhead. This one year (365 days) warranty is valid only if a Datamax - approved thermal label media is used, as defined in the then current Datamax list of approved thermal/thermal transfer media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this thermal printhead warranty. This warranty does not cover printheads which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to Datamax at: 4501 Parkway Commerce Blvd., Orlando, Florida, 32808. A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA please call the Datamax Customer Service Department at (407) 523-5550. Please include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost.

With respect to a defect in hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for sixty (60) days after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

Software is licensed on an “as is” basis without warranty. Except and to the extent expressly provided in this warranty and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax’s products.

Limitation of Liability

In no event shall Datamax be liable to the purchaser for any indirect, special or consequential damages or lost profits arising out of or relating to Datamax’s products, or the performance or a breach thereof, even if Datamax has been advised of the possibility thereof. Datamax’s liability, if any, to the purchaser or to the customer of the purchaser hereunder shall in no event exceed the total amounts paid to Datamax hereunder by the purchaser for a defective product.

In no event shall Datamax be liable to the purchaser for any damages resulting from or related to any failure or delay of Datamax in the delivery or installation of the computer hardware, supplies or software or in the performance of any services.

Some states do not permit the exclusion of incidental or consequential damages, and in those states the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from state to state.

Glossary

alphanumeric Consisting of alphabetic, numeric, punctuation and other symbols.

backing material The silicon-coated paper carrier material to which labels with adhesive backing are affixed. Also referred to as “liner”.

bar code A representation of alphanumeric information in a pattern of machine-readable marks. The basic categories are divided into one-dimensional (UPC, Code 39, Postnet, etc.) and two-dimensional barcodes (DataMatrix, MaxiCode, PDF417, etc.).

burn line The row of thermal elements in the printhead that create the images on the media.

calibration The process through which sensor readings are entered into the printer for correct sensor function (for example, detection of a given media type) and TOF positioning.

character set The entire complement of alphanumeric symbols contained in a given font.

checksum An alphanumeric error detection method used in many bar code symbologies for informational security.

continuous media An uninterrupted roll or box of label or tag media that contains no gap, notch, or mark to separate individual labels or tags.

core diameter The inside diameter measurement of the cardboard core at the center of a ribbon or media roll.

cutter A mechanical device with a rotary or guillotine type blade used to cut labels or tags following printing.

defaults The functional setting values returned following a factory reset of the printer.

diagnostics Programs used to locate and diagnose hardware problems.

die-cut media Media that has been cut into a pattern using a press, where the excess paper is removed leaving individual labels, with gaps between them, attached to a backing material.

direct thermal The printing method that uses a heat sensitive media and only the heat of the thermal printhead to create an image on the label.

direct thermal media Media coated with special chemicals that react and darken with the application of heat.

DPI (dots per inch) A measurement of print resolution, rated in the number of thermal elements contained in one inch of the printhead. Also referred to as "resolution".

DPL (Datamax Programming Language) programming commands used specifically for control of and label production in Datamax printers. A complete listing of commands can be found in the *E-Class Programmer's Manual.*

fan-fold Media that is folded and stacked.

feed speed The speed at which the media moves under the printhead in non-printed areas and between labels.

Flash memory Non-volatile memory (does not require printer power to maintain data) that can be erased and reprogrammed, used to hold the printer's operating programs.

font A set of alphanumeric characters that share a particular typeface.

gap A space between die-cut or notched labels used to sense the top of form.

IPS (inches per second) Imperial measurement of printer speeds.

label A paper or synthetic printing material, typically with a pressure sensitive adhesive backing.

label length The distance from the top of the label to the bottom of the label as it exits the printer.

label repeat The distance from the top of one label to the top of the next label.

label tracking Excessive lateral (side to side) movement of the media as it travels under the printhead.

label width The left to right measurement of the label as it exits the printer.

mark Generalized term to indicate the label top of form indicator.

media Generalized term for all types of printing stocks, including: roll fed, continuous, die-cut, reflective, and fanfold.

media hub Device in the printer used to support roll media.

media sensor An electronic device equipped with photosensors to detect media and the top of form on die-cut, notched or reflective media.

notched stock Media, typically tag stock, with holes or notches in the material that is used to signal the top of form. The printer must be set to 'gap' to use this media type.

preprinted media Label stock that contains borders, text, or graphics, floodcoating, etc.

perforation Small cuts extending through the backing and/or label material to facilitate their separation. Also referred to as "perf".

print speed The speed at which the media moves under the printhead during the printing process.

reflective media Media imprinted with carbon-based black marks on the underside of the material, which is used to signal the top of form when the 'reflective' sensor is enabled.

registration Repeatable top to bottom alignment of printed labels.

reverse speed The backward rate of media motion into the printer during tear-off, peel and present and cutting operations for positioning the label at the start of print position.

ribbon An extruded polyester tape with several layers of material, one of which is ink-like, used to produce an image on the label. Also referred to as "foil".

ribbon wrinkle An undesirable overlapping of the ribbon during the printing process that leads to voids on the printed label, typically caused by an improper ribbon width adjustment.

roll media A form of media that is wound upon a cardboard core.

start of print The position on the label where the printing actually begins.

tag stock A heavy paper or synthetic printing material, typically featuring a notch or black mark for TOF and no adhesive backing.

thermal transfer The printing method that creates an image by transferring ink from a ribbon onto the media using the heat from the thermal printhead.

TOF (top of form) The start of a new label as indicated by a label gap, notch, mark or programming.

void An undesirable blank space in a printed image.

Index

A

accessories CD-ROM, *1, 6*
adjustable media sensor, *3, 9 - 11, 50 - 52, 55*
alphanumeric, *60, 61, 63, 64, 73, 75*
ASCII, *39, 57, 59, 63, 64*
auto calibration, *35*
Aztec, *54, 64, 68*

B

backing material, *24, 36, 55, 73 -77*
bar code, *51, 54, 63 - 68, 73*
baud rate, *22, 23, 26, 27, 54*
black mark, *55*
buttons, *19 - 22, 34*

C

calibration, *13, 14, 20, 34, 73;* also see:
  auto, *35*
  manual, *36, 37*
character set, *73*
checksum, *63, 66, 73*
Codabar, *54, 63, 66*
Code 128, *54, 63, 65, 67*
Code 3 of 9, *54, 63 - 66, 68*
Code 93, *54, 63, 66*
communications, *21, 39, 48, 54*
configuration label (see *Database Configuration Label*)
continuous media, *10, 23, 24, 28, 54, 73, 75*
control codes, *24*
core diameter, *2, 3, 15, 54, 73, 76*
cutter, *3, 21, 23, 25, 34, 54, 74*

D

darkness adjustment, *27, 38, 46, 47, 50*
data bits, *23, 27, 38, 54*
database configuration label, *20, 27, 30, 32, 37, 38*
DataMatrix, *54, 64, 68, 73*
defaults, *21, 23 - 25, 34, 47, 74*
die-cut media, *10, 54, 55, 74, 75*
direct thermal, *1, 2, 15, 23, 27, 38, 53, 55, 74*
dot check label, *20, 37, 38*
downloads, *47, 48*
DPI, *53, 74*
DPL, *25, 39, 74*

E

EAN-8, *54, 63, 63*
EAN-13, *54, 63, 63*

F

factory defaults, *21, 23 - 25, 34, 47, 74*
fails to power on, *49, 51*
fan-fold, *2, 54, 74*
feed speed, *74*
FIM, *64, 68*
fixed-position media sensor, *9*
flash memory, *17, 47, 48, 53, 74*
fonts, *2, 3, 17, 24, 27, 38, 47, 54, 58 - 62, 73, 75*
front panel, *19, 22*

G

gap, *10, 23, 24, 52, 55, 73 - 77*

H

hardware handshake, *39, 54, 58*
hex dump, *39, 40*

I

input mode, *25*
interfacing, *1, 2, 8, 54*
Interleaved 2 of 5, *54, 63, 65, 66*
internal labels, *37- 40*
internal module, *24, 27, 38*
IPS, *53, 75*

K

Kanji, *3, 64*

L

label, *1, 6, 10, 14, 20, 23 - 25, 37, 43, 47, 49 - 52, 55, 73 - 77*
label alignment, *24, 25, 27 - 29, 38*
label alignment troubleshooting, *30 - 33*
label width, *24, 55, 75*
lights, *19*
loading media, *12 - 14, 52*
loading ribbon, *15, 16*

M

manual calibration, *36, 37*
media, *10, 12 - 16, 20, 23 - 25, 28 - 30, 34 - 37, 41, 43, 45, 47, 49 - 52, 54, 55, 73 - 77;* also see:
  continuous, *10, 23, 24, 28, 54, 73, 75*
  die-cut, *10, 54, 55, 74, 75*
  direct thermal, *23, 27, 38, 55, 74*
  fan-fold, *2, 54, 74*
  notched, *10, 75, 76*
  reflective, *10, 23, 24, 36, 55, 75, 76*
  roll, *12, 54, 75, 76*
  thermal transfer, *15, 16, 23, 53, 77*
media sensor, *24, 28, 29, 31, 34 - 36, 41, 50 - 52, 55, 75;* also see:
  adjustable, *9 - 11, 50 - 52, 55*
  fixed-position, *9, 28, 55*
media sensor calibration, *13, 14, 20, 34 - 37, 73*
media type switch, *15, 50*
memory, *17, 24, 25, 27, 37, 38, 47, 48, 53, 74*
menu items, *22 - 25*
MicroPDF417, *54, 64, 68*

N

no printing, *50*
notched stock, *10, 75, 76*

O

OOS maxvolt, *24, 27, 38*
operating program, *47, 74*

P

packaging, *5, 6*
parallel, *8, 54*
PDF417, *54, 64*
peel configuration and mode, *14, 21, 25, 26, 33, 41, 76*
perforation, *76*
Plessey, *54, 63, 66*
Postnet, *54, 63, 66*
power, *5 - 8, 27, 28, 38, 51, 53*
preprint, *76*
present adjust, *23, 25, 27, 33, 38*
present sensor, *4, 21, 23, 26, 29, 30, 33*
print method, *53*
print quality, *39, 45, 49, 50, 55*
print speed, *3, 47, 50, 53, 76*
printer setup, *21 - 28, 30, 39, 48*
printhead, *16, 28, 29, 38, 41 - 43, 45 - 47, 50, 51, 53, 55, 73 - 77*
printhead adjustment, *45*
printhead carrier assembly, *9, 12 - 16, 35 - 36, 42, 43, 45, 46, 51*
printhead replacement, *46, 47*

Q

QR Code, *54, 64, 68*

R

reflective media, *10, 23, 24, 36, 55, 75, 76*
registration, 76

resolution, *53, 74*
reverse speed, *76*
ribbon, *15, 16, 23, 44, 50, 52, 54, 55, 73, 76, 77*
ribbon loading, *15, 16*
ribbon width adjustment, *44, 76*
ribbon wrinkle, *76*
roll media, *12, 54, 75, 76*
rotation, *51, 54*

S

scalable font, *2, 3, 24, 27, 38, 59*
sensor type, *23, 24*
serial, *8, 23, 26, 27, 38*
skips labels, *51*
standard features, *2*
start of print, *23, 29, 31, 76*
stop location, *25, 27, 38*

T

tag stock, *1, 3, 73, 74, 76, 77*
Telepen, *54, 63, 68*
test label, *20, 39*
thermal transfer, *15, 16, 23, 53, 77*
top of form, *10, 20, 23, 28, 29, 36, 75, 76, 77*
TOF delta, *24, 27, 35, 38*
TOF gain, *22, 24, 27, 38*
TOF low, *24, 27, 38*
tracking, *13, 14, 39, 43, 52, 75*
troubleshooting, *30 - 33, 49 - 52*

U

UPC-A, *54, 63, 65*
UPC-E, *54, 63, 65*
UPS MaxiCode, *54, 63, 64, 68*

V

voids, *76, 77*

W

warranty, *69, 70, 71*